MARCH 1953
90th Year

AMERICAN ARTISAN

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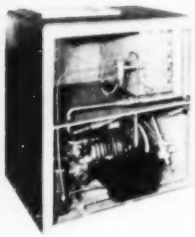

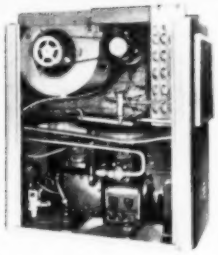

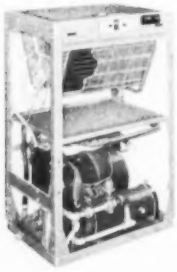

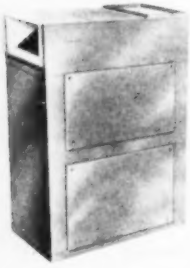
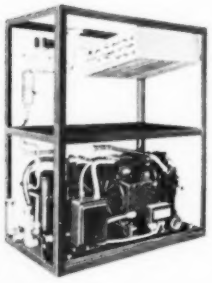

SURVEY OF COMPLETE packaged central residential cooling units for use with warm air heating systems to provide summer air conditioning in new and existing homes ..... Pages 52 through 62

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AIR CONTROL

"I'm a heating man; been in the business for years. That's why, when others using grilles, registers and diffusers tell me they're *switching* to Air Control, they're talking right down my alley!

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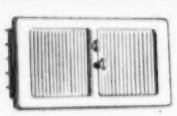
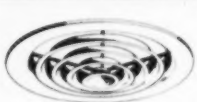


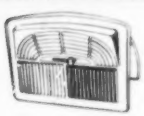
Registers & Grilles

Perimeter Floor Diffusers

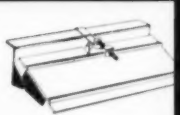


Ceiling Diffusers

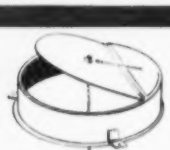
Return Air Intakes



Perimeter Sidewall Diffusers

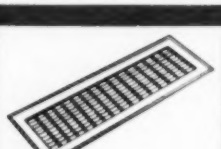


Stackhead Dampers

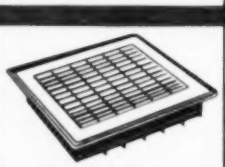


Diffuser Dampers

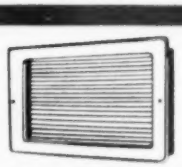
Gravity Registers



Return Air Faces



Floor Registers



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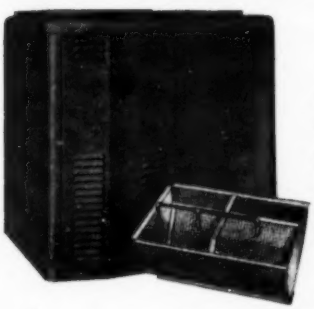

NEW Automatic Humidity Control available on CENTURY Loboys

EXCLUSIVE new CENTURY AIR WASHER-HUMIDIFIER for automatic and exact "living room control" of humidity. Fits most manufacturers' basement models. Available on the newly engineered CENTURY Loboys. (6 models gas — 8 models oil).

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AMERICAN ARTISAN

MARCH 1953

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Founded 1864

Volume 90 No. 3

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WARM AIR HEATING

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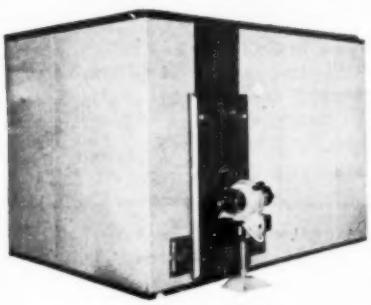

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700 series

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The "900" oil fired furnace with pre–installed refractory and standard casing is comparable in quality and efficiency with the best furnaces of other makes – a real buy! 80,000 to 108,000 BTU at bonnet.

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WATERTOWN — *WISCONSIN*

8–5–2

the editor's notebook

Hold Conference on Odor Research

BASIC ODOR research correlation will be the subject of a two-day conference sponsored jointly by the American Society of Heating and Ventilating Engineers and the New York Academy of Sciences. It will be held on April 23 and 24, in New York City.

The odor problem, which is of serious concern to sheet metal contractors installing ventilation systems in manufacturing and commercial locations, will be discussed by outstanding investigators working in the field.

Dr. A. R. Behnke, U.S. Navy, will preside as general chairman. Subjects discussed at the various sessions will include: basic types of industrial odor problems, problems of odor research from the viewpoint of the scientist, the olfactory process — status of present knowledge, and subjective and objective measurement techniques and experimental studies in odor.

Anthracite Trends to be Discussed

LATEST DEVELOPMENTS in the distribution, utilization, economic and hygienic aspects of anthracite will be subjects for the 11th annual Anthracite Conference set for May 7 and 8 at Lehigh University.

The conference, sponsored by the Anthracite Institute and Lehigh University, is designed to bring engineers, educators, operators and retail dealers as well as the general public up to date on the technological progress in Pennsylvania's hard-coal industry.

Serving as members of the planning committee are representatives of educational institutions, research groups, anthracite operators and retailers.

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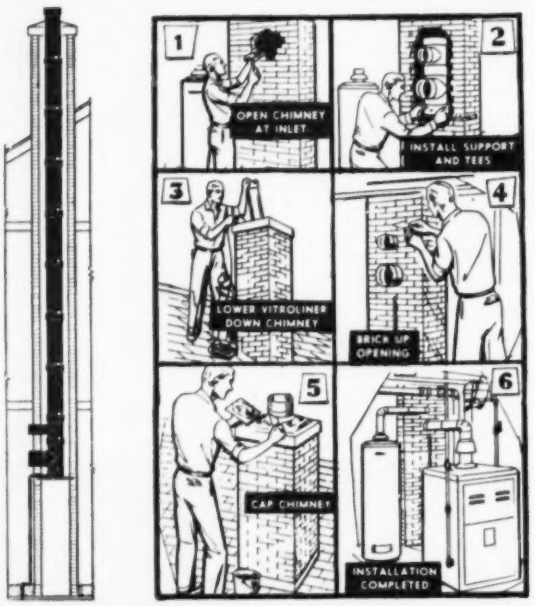

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HERE'S HOW you install the BEST chimney liner on the market. It's simple and easy when you follow the five illustrated steps above. There's no fuss cutting or fitting on the job,—each section has bell and spigot joints that fit perfectly.

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1. Vitroliner is guaranteed in writing for a 10 year period. It will stand the test of time and extend chimney life.

2. It is impervious to acids and salt air conditions. Modern fuels like gas and oil will not harm VITREOUS ENAMELED Vitroliner.

3. Masonry chimneys are completely protected. The combustion gases are kept in the liner away from the brick and mortar.

4. Vitroliner creates better draft, greater efficiency in the heating unit, and reduces fuel consumption.

5. Tried and proven successful for over 20 years. The oldest chimney lining installations are still in good operating condition.

If you want to use the best product for chimney lining write today and get the full story. The demand for Vitroliner is growing in every city with the demand for modern fuels.

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Foresee Rise in Real Income

TAX CUTS in the next two years should mean 3 per cent more purchasing power; the price trend is also down, and this could add another 3 per cent to purchasing power, according to the National Foremen's Institute, Inc. Some wage rates, on the other hand, may continue to rise because of steadily advancing productivity. It is possible then, that the gain in real income during the next two years will amount to 10 per cent. However, for factory workers presently working considerable overtime, a shorter work week would offset much and perhaps all these gains, the institute predicts.

Revise Gas Floor Furnace Standard

THE REVISED edition of the *Commercial Standard for Gas Floor Furnaces* is now available, the Commodity Standards Div., U. S. Department of Commerce, has announced. The Commercial Standard applies to natural draft gas floor furnaces of the gravity circulating type. Its purpose is to establish minimum specifications for these furnaces as a guide to manufacturers, distributors, and users.

With the American Standard Z21.13, *Approval Requirements for Central Heating Gas Appliances*, published by the American Gas Assn., as basic prerequisites, and in conformity with the American Standard Z21.30, *Installation of Gas Piping and Gas Appliances in Buildings*, published by the American Gas Association, this stand-

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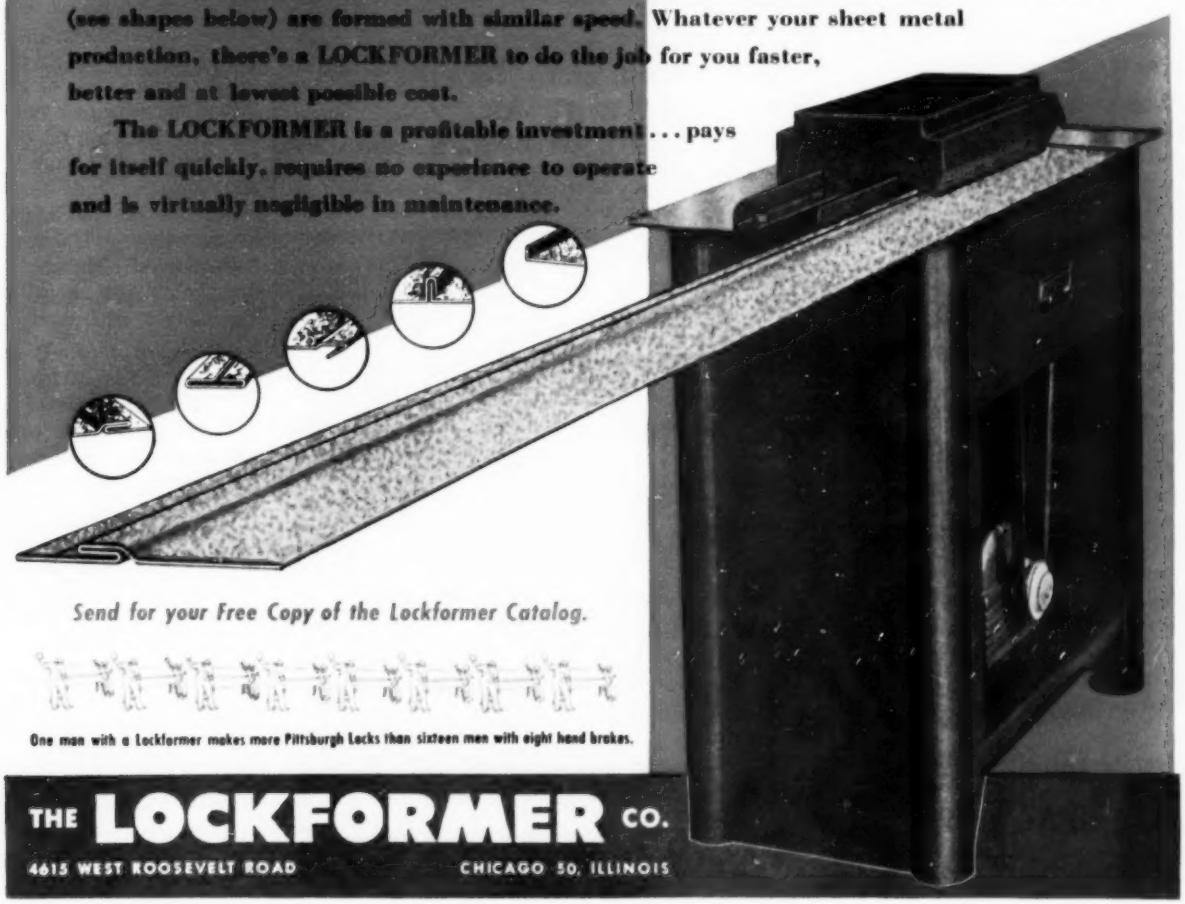

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THE LOCKFORMER CO.

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the editor's notebook

(continued)

ard covers construction and installation requirements for gravity circulating type gas floor furnaces, including those having single or dual wall register outlets, for use with natural, manufactured, mixed, liquefied-petroleum, and liquefied-petroleum-air gases. It includes definitions, sizing, placement, general installation requirements, venting, gas connections, and methods of certifying compliance with the standard.

Copies of the pamphlet, entitled *Gas Floor Furnaces — Gravity Circulating Type*, Second Edition, Commercial Standard CS99-52, may be purchased from the Superintendent of Documents, Government Printing Office, Washington 25, D. C., at five cents a copy.

Report Stoker Sales For 1952

ACCORDING TO the Stoker Manufacturers Association, sales of class 1 stokers for residential heating purposes in 1952 totaled 16,141 compared with 16,719 in 1951. Bituminous domestic stoker sales barely "edged out" anthracite stokers in this category with 8080 machines compared with 8061 for anthracite. Anthracite domestic stokers of all types (conversion and integral units) in 1951 totaled 4268; thus sales in 1952 of this type nearly doubled. Anthracite integral units (combining boiler or furnace with stoker mechanism) accounted for a large part of anthracite domestic stoker sales in 1952 — 5723 compared with 2338 conversion units.

Stainless Steel Ingot Production Up

THE PRODUCTION of stainless steel ingots continued to increase as a percentage of total

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A superior quality, precision instrument with full view, solid red thermometer-type indicator

Without question, here is the easiest to read, *accurate measure* gauge on the market—And, the easiest to install, whether tank is empty, full or partially full. Unit features zinc base metal, two-piece die-cast assembly — Unbreakable red plastic assembly nut — Calibration chart, sealed between heavy, heat-resistant plastic domes — Brass rivets — And, a *double coated* cork float that's impervious to oil, many chemicals and acids. No gears, magnets, cams or tapes. Guaranteed to withstand in excess of 70 lbs. pressure per sq. inch. Tailor-made to fit individual tanks up to 12 ft. deep. Calibrated and factory adjusted.

QUICKLY, SIMPLY INSTALLED. Illus. at left shows how entire calibration and float assembly may be inserted and positioned *after* two piece die-cast tank plug has easily been installed in tank — only an ordinary wrench is needed.

SENTR-ECON

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Exceptionally high quality for such a competitively priced gauge. Features patented *double dome* with calibrations positioned between inner tube and outer heat-resistant plastic shell. Also, die-cast tank fitting — plated metals — brass rivets. No gears, magnets, cams or intricate mechanisms. *Double coated* cork float is impervious to oils, most chemicals and acids. Simple to install, even in partially-filled tanks. 1½" openings only. Factory calibrated and adjusted to insure accuracy.

KRUEGER *Sentry* GAUGES

GREEN BAY • WISCONSIN

the editor's notebook

(continued)

steel production in 1952, the American Iron and Steel Institute recently reported. The preliminary report on output for last year was 901,831 net tons, or nearly 0.97 per cent of the total raw steel output. Although the quantity was almost 32,000 tons smaller than in 1951, the percentage moved up from a little under 0.89. The percentage of stainless to total steel has increased almost every year since the early 1930's, while the tonnage in 1952 was nearly 12 times that of 1935. Last year's output, interrupted by strikes, was second only to the 1951 output.

How Can We Beat The Engineer Shortage?

WHAT'S TO BE DONE about the critical gap between American industry's increasing demand for engineers and the declining supply of graduates from engineering schools? That was the problem considered by more than 300 educators and industry representatives meeting at Northwestern University's Technological Institute for the school's fifth annual college-industry conference.

Clarence E. Deakins, dean of students, Illinois Institute of Technology, pointed out that each year the nation needs, for replacement alone, an estimated 30,000 new engineers. But next June colleges are expected to graduate but 24,000 — with this number declining to 19,000 in 1954 and to 17,000 in 1955.

As two parts of a suggested six-point program to increase the number of engineering students, he urged that there be earlier identification of engineering aptitudes and interests among secondary school students, and that industry increase its scholarship funds for talented students

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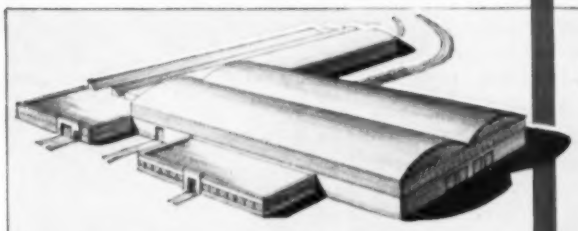

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now lost to industry because they cannot afford an engineering education.

Training and using skilled assistants is one way to beat the engineer shortage, it was emphasized at the meeting.

Aluminum Production Sets Record

U.S. PRODUCTION of primary aluminum during 1952 hit an all-time peak, Donald M. White, secretary of The Aluminum Association, has disclosed. "The yearly production reached a total of 1,874,642,692 lb, 34 million lb above the previous peak established in 1943," he said. The new record was 12 per cent greater than 1951 figures, when 1,673,758,854 lb were produced. "Production of 470,719,231 lb during the last quarter contributed greatly to the new level," Mr. White said. The final month's production of 166,817,187 lb was 22 million lb greater than the 144,907,819 lb produced in December, 1951.

Shipments of sheet and plate by member companies of the association's sheet division amounted to 305,461,732 lb for the last quarter of 1952, to make a total of 1,071,976,000 lb for the year. The 1952 shipments ran slightly under the 1951 total of 1,076,226, 278 lb.

Increase in Use of Oil Heating Units

T. A. CRAWFORD, president, Oil-Heat Institute of America, Inc., announced that recent market studies indicate a 5 to 8 per cent increase in 1953 over 1952 of automatic oil heating equipment installations.

He stated that the public acceptance of oil heating equipment has expanded the need for additional manpower to meet consumer demand.

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PROFIT TOWN, U.S.A.
NOW THREE LARGE CAPACITY MODELS XL-10, XL-15 AND XL-20 AVAILABLE IN THE FAMOUS NU-WAY LINE OF OIL BURNERS. FUEL BURNING CAPACITIES 10 G.P.H. TO 20 G.P.H. DESIGNED FOR USE IN APARTMENTS, FACTORIES AND OTHER BUILDINGS REQUIRING LARGE CAPACITY OIL INSTALLATIONS. NU-WAY'S EXCLUSIVE PATENTED FEATURES INCLUDED. MEANS EASIER SALES, MORE PROFIT. COMPLETE SPECIFICATIONS AND DATA SENT UPON REQUEST.
NU-WAY CORPORATION
ROCK ISLAND, ILLINOIS
NU-WAY
OIL HEATING EQUIPMENT
Sold through Jobbers and Distributors
Also Special Applications for Furnace or Boiler Manufacturers
"Automatic Oil Heat Exclusively Since 1921"

"In residential, commercial and industrial fields," he said, "the industry needs service men, technicians, engineers, salesmen, sales engineers and sales managers at dealer, distributor and manufacturer levels."

The estimate for 1952 is 1,520,000 oil burners, furnace-burner and boiler-burner units. For centrally heated homes, 725,000 power-driven burners and 750,000 vaporizing burners were installed. Power-driven burner sales showed an increase of 5 per cent over 1951 and vaporizing burners about 1 per cent.

Promoting Safe Use of Gas

THE GAS INDUSTRY is taking the lead in reducing accident hazards connected with gas appliances, according to C. George Segeler, utilization engineer of the American Gas Association, who spoke at the recent national conference on home accident prevention at Ann Arbor, Mich. The conference was sponsored by the U. S. Public Health Service, the National Safety Council, American Public Health Association and the School of Public Health, University of Michigan. It was attended by more than 150 officials and representatives engaged in federal, state and city public health activities. The conference was part of a planned program to attack home accidents.

Mr. Segeler pointed out that the records of the American Gas Association show that gas utility companies serve 91.2 million people. Even with this total exposure, he pointed out, gas and gas appliances for many years have been near the bottom of a list published annually by the National Fire Protection Association, reporting fire causes by frequency and

Hot Tip for Cold Weather PROFITS

TORIDHEET

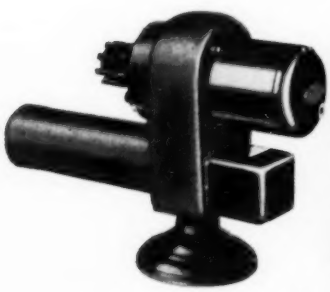
Pressure-Type Oil Burners

• So quick and easy to install you don't have to wait for warm weather. Pressed steel housing makes it light enough for one man to handle easily, saves freight expenses, too.

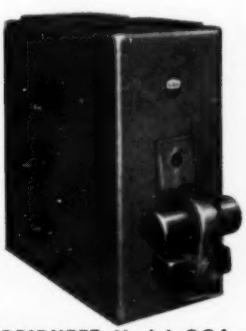
Features your customers will like include: pre-metered air flow; complete absence of exposed gears, buttons or levers; and, above all, famous TORIDHEET reliability of operation, developed from 28 years of pioneering research.

Sell TORIDHEET and take pride in selling a product that sells easily and *stays sold.*

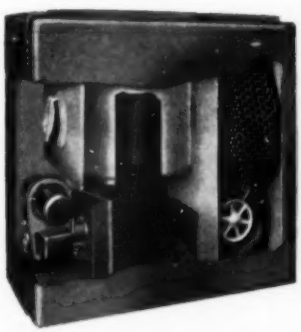
TORIDHEET Model J gun-type conversion unit. Capacity ¾ to 3 gal. per hour. An ideal unit for small to medium-large homes.



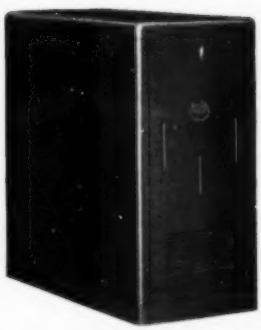
TORIDHEET Model L gun-type conversion unit. Capacity 2½ to 6 gal. per hour. Consistent performance for large residential and light commercial uses.



TORIDHEET Model OGA-65 low cost gun-fired winter air conditioning units specially designed for today's small homes.



TORIDHEET Model OGA gun-fired winter air conditioners provide clean automatic heating comfort for medium and large sized homes.



TORIDHEET Model OGU Boilers—ideal for radiant panel heating.

Other Toridheet Units for every need... every budget... Wall Flame Burners... Rotary Fired Boilers and Furnaces... Gas Conversion Burners and Gas Fired Furnaces

CLEVELAND Toridheet AUTOMATIC HEATING

TORIDHEET DIVISION
CLEVELAND STEEL PRODUCTS CORPORATION
7318 Madison Avenue Cleveland 2, Ohio

Affiliated Canadian Manufacturers: Conroy Mfg. Company, Ltd., Catherine St., St. Catherines, Ont.

amount of loss. In the 1951 list, the most recent report, gas and gas appliances stood 19th on a list of 25 causes.

This safety record, Mr. Segeler said, is in great part due to the fact that more than 95 per cent of all domestic gas appliances are tested and approved in AGA laboratories under requirements that are adopted as American Standards.

Despite initial safety built into gas appliances, incomplete combustion remains a hazard, he pointed out. The misuse of gas appliances stems from three possible causes. The air shutter of the burner sometimes clogs or is not adjusted correctly and lack of oxygen can cause the flame to extinguish. Again, appliances may be located where there is not sufficient infiltration of air into a room. The third cause is a stuffed flue or defective outlet or chimney.

More Gas Heating Equipment Shipped

THE GAS APPLIANCE Manufacturers Association, Inc., reports that during the calendar year 1952, industry-wide shipments of gas fired central heating equipment (furnaces, conversion burners, and boilers) approximated 737,000 units, as compared with 614,500 units shipped during 1951, an increase of 19.9 per cent. Total industry shipments during the month of December, 1952, were about 47,900 units, or 8.6 per cent greater than during December of the preceding year, when 44,100 units were shipped.

For gas fired furnaces, 12 month shipments were 456,400 units, compared with 390,000 units shipped during 1951, a 17.0 per cent increase. Gas conversion burner shipments approximated 212,000 units during the calendar year 1952, compared with 164,000 units shipped during the same period in 1951, a 29.3 per cent increase.

Sun FUEL MASTER

... Gives you

DOUBLED SALES

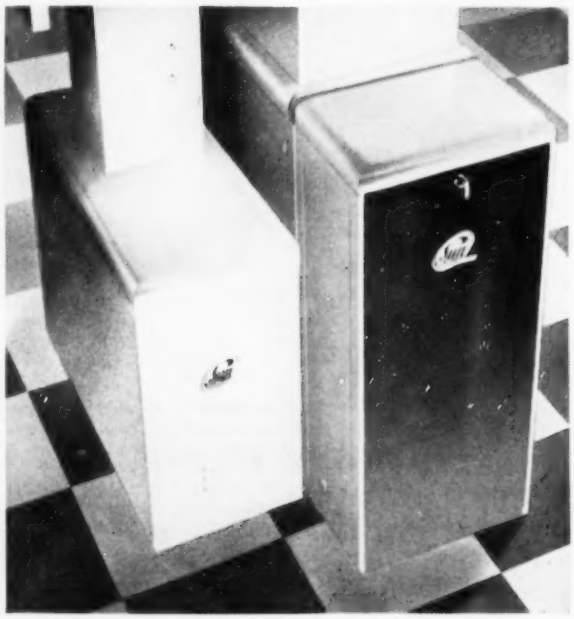
SUN gives you a *complete* line of home air conditioning units for *all*-season selling. With SUN you can sell winter heating *plus* summer cooling and *double* your sales. Sales to builders are easier to make because homes equipped with heating *and* cooling are easier for them to sell. Owners too are easier to sell because they get heating *and* cooling in one package at one complete price. If you haven't all the facts about the SUN franchise, phone, wire or write today to J. V. Patten Company, 550 DeKalb Avenue, Sycamore, Illinois.

SUN COMPRESSOR COOLING UNIT

Delivers just-right temperature to every room in the house. Compact; easy to install; completely enclosed; hermetically sealed; inbuilt blower; beautiful appearance; 5-year unconditional guarantee.

SUN AUTOMATIC FURNACE

Oil or gas fired; one-piece construction; increased efficiency; quiet operation; easier installation; new compact beauty; capacities —72,000 to 224,000 Btu.



Novel Fan Ventilates Underground Works

THE ONLY one of its type in Canada, a towering 20 ton exhaust fan, shaped like a huge malted milk container, has been installed by The International Nickel Co. of Canada, Ltd., to ventilate the underground workings of the new caving project at its Creighton Mine in the Sudbury District of Ontario.

The giant vertical fan, driven by a 350 hp motor weighing 5 tons, ventilates the workings by a flow of fresh air at the rate of 300,000 cfm. The fan draws the air down from the surface, directly through the caved or broken ore, circulates it through the underground workings and carries it back to the surface through a main return shaft.

Insulation Made from Slag

A MATERIAL that was once a waste and a disposal problem, blast furnace slag, which contains the unwanted elements of ironmaking, now is being widely used as thermal and acoustical insulation. Of the estimated 39 million tons of waste produced in 1951, about 29 million tons were processed and sold by 43 companies.

The slag is cooled either by air or water, but during the cooling process it is expanded to form many minute air cells which act as heat barriers and sound traps.

According to the American Iron and Steel Institute many other uses have been found for slag, as roofing granules, in highway and airport construction, as a soil conditioner, etc.

The Right Register—

FOR EACH OF YOUR SMALL PIPE INSTALLATIONS

BY Char-Gale

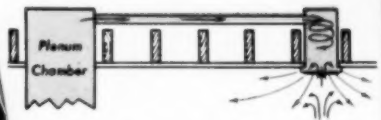


Diagram of typical Char-Gale "Gale-Aire" Ceiling Diffuser Installation.

A circular outward thrust imparted to the air entering the register box, produces a partial vacuum in the center of the cylinder. Room air is drawn up into the box and blended with the heated air to provide a gentle, effective warming action.

Proper registers are essential to the proper operation of small pipe systems. Char-Gale's complete selection makes it easy for you to choose exactly the right register for every situation.

"GALE-AIRE" CEILING DIFFUSER

Newest Char-Gale register, the "Gale-Aire" Ceiling Diffuser is designed to provide effective air tempering and distribution. The unit includes a cylindrical box, fitting ring, foam rubber gasket, and register.

"GALE-AIRE" SIDEWALL REGISTER

The "Gale-Aire" Sidewall Register distributes air evenly in all directions along the wall. Adjustable, it permits complete balancing at the registers. Complete with register, box and a foam rubber gasket.

"GALE-AIRE" BASEBOARD REGISTER

Including all the features of the Sidewall Register, the "Gale-Aire" Angle Baseboard Register is designed especially for older homes. It is installed through a floor opening, with no wall cuts needed.

MEMBER
INDOOR COMFORT

"GALE-AIRE" FLOOR DIFFUSER

Answers the need for an inexpensive method of distributing air along outside walls. Vanes set at proper angles to achieve a fan-shaped diffusion pattern.

Remember:

Char-Gale provides everything from plenum to register in the "Gale-Aire" System. Also a complete line of registers and fittings for your conventional installations.

Contact your jobber or write us direct

CHAR-GALE MANUFACTURING COMPANY

MINNEAPOLIS-MINNESOTA

FORMULA .
Waterbury
BTU = AREA X
BTU = 860 X .25 X 90
X 22.5
BTU = 19,350
Waterbury

• • FOR MORE DEALER SALES!

Every day more and more dealers learn that the best formula for customer satisfaction is sound merchandising plus Waterbury quality. There's a unit for every heating job, and the attractive appearance of the Waterbury line appeals to customers instantly. But more important—dealers have learned that Waterbury builds consumer acceptance and confidence by consistently maintaining the highest warm air heating standards.

Waterbury

"IT'S WHAT'S UNDER THE CASING THAT COUNTS!"

The Waterman-Waterbury policy provides exclusive distribution rights and develops a close, personal relationship between dealers, distributors, and factory. You will find, as many dealers have, that the dependability and economical operation of every Waterbury furnace or winter air conditioner is your assurance of a satisfied and growing list of customers.

The Waterman-Waterbury Co.

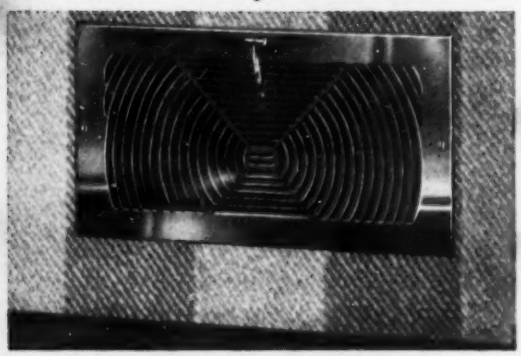
OVER 46 YEARS OF WARM AIR HEATING

1122 Jackson Street N. E. • Minneapolis 13, Minnesota

DIFFUSAIRES

BASEBOARD & SIDEWALL

PROVIDE PERFECT AIR PATTERNS *for* PERIMETER HEATING!



SIDEWALL INSTALLATION

H&C No. 40 is the only really practical sidewall diffuser on the market. Provides 180° spread of warm air to blanket cold wall area, with just enough warm air deflected to the floor. It's exceptionally low in resistance and has positive means of balancing system at register face. Eliminates necessity of cutting floor coverings. Sealed against streaking.

FLOOR INSTALLATION

The No. 411 is definitely superior to other diffusers in this class. It has opposed louvers (in all but the 2¼" width) for undistorted airflow, regardless of volume; quick, positive volume control for balancing at the face; curved diffusion vanes for ideal air pattern; foot-operated, trouble-free valve control.

If you are one of the thousands who saw the air flow demonstrations at the H&C exhibit at the Chicago Exposition, you know, beyond the shadow of a doubt, that the one absolutely sure way to achieve the perfect air pattern for perimeter heating is to use either the H&C No. 40 Design Sidewall Diffusaire or the H&C No. 411 Diffusaire for floor installation. Definitely superior in both design and construction, and yet priced right along with competitive makes, these Diffusers will enable you to provide the very finest, customer-pleasing installations, without adding anything extra to your costs.

See **these outstanding Diffusers and our No. 4 Frame (for use with the No. 40 Diffusaire where masonry walls are encountered) at your H&C Jobbers. Current catalog No. 52 showing the ideal register for every type of installation may be had on request.**

MEMBER NODOR COMFORT

HART & COOLEY MANUFACTURING CO.

800 EAST EIGHTH ST., HOLLAND, MICH.

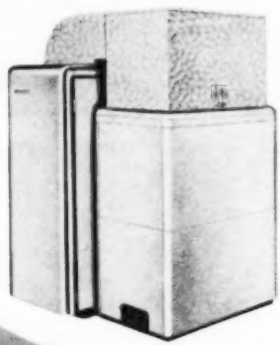
In Canada: Hart & Cooley Manufacturing Co., Fort Erie, Ontario

PRODUCT OF THE WORLD'S LARGEST and MOST PROGRESSIVE PRODUCERS OF REGISTERS and GRILLES

Get More "Year Round" Sales with *Luxaire* "Year Round" Air Conditioner

The *Luxaire* Summer Air Conditioner 2-3-5-7½ ton Capacities

The Complete *Luxaire* YEAR ROUND Air Conditioner



For Forced Air Heating Systems NEW and OLD

The Luxaire Summer Air Conditioner

- . . . . Factory assembled. Attractive-compact.
- . . . . Readily connected to existing forced air systems.
- . . . . Requires small installation space.
- . . . . Uses heating system ducts.
- . . . . Dehumidifies the air as it cools.
- . . . . Quiet . . . . Dependable . . . . Competitively priced.

QUICK . . EASY TO INSTALL

Get the complete details from your Luxaire jobber. Now! It's time to sell Summer Air Conditioning NOW! Homebuilders are Summer Air Conditioning-minded NOW!

The *Luxaire* Self Contained Air Conditioner

For Business Places of All Kinds

Available in 4 Sizes

2-3-5 and 7½ Ton

Easy to Install Anywhere!

THE *Luxaire* C. A. OLSEN MANUFACTURING COMPANY • • ELYRIA, OHIO

HEATING & AIR CONDITIONING UNITS

John Mauldin, John Mauldin, Inc., on the right, talking to Honeywell sales engineer Tom Lee

"Electronic Moduflow is needed in the mild southern climate, too!"

Read this case for Honeywell Electronic Moduflow, as presented by Atlanta heating dealer John Mauldin!

"Electronic Moduflow is *the answer* to satisfying customers in the South.

"As you know, our weather here is rather unpredictable. The winter mornings are often cold, but the afternoons are warm. As a result, heating requirements vary widely.

"This causes a good many people to spend a lot of their time jiggling thermostats.

"This thermostat jiggling is the homeowner's way of adjusting indoor temperatures to varying outdoor conditions.

"You see, because of varying heat loss through walls and windows, room temperature should be higher when it's cold outside, lower when the weather warms up.

"Electronic Moduflow makes these adjustments *automatically*. It provides constant comfort by *varying* indoor temperatures.

"Moduflow makes it easier for me to *satisfy and keep* customers."

H HONEYWELL

Another Plus-Profit idea from Honeywell

Southern dealers are making money selling the magic of Honeywell Electronic Moduflow—you can, too!

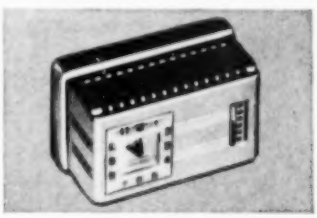
Many heating men in the South, led by forward-thinking dealers like Atlanta's John Mauldin, are recognizing the tremendous superiority—*and salability*—of electronic controls over controls of the mechanical variety.

They see electronic controls as the coming thing in heating. They see the day when every home will have them.

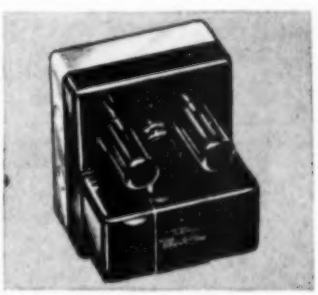
Electronic Moduflow is 28 times more accurate and sensitive than ordinary mechanical systems of control. It operates a heating plant in a series of planned, timed cycles, regulating heat as the *temperature outside requires*. By means of special, *coordinated* inside and outside electronic thermostats, heating needs are accurately measured, with the heat "metered" accordingly. These heat cycles are timed to keep the air in motion. This helps prevent undesirable stratification—which means you cut down on hot ceilings and cold, drafty floors.

Electronic Moduflow is simple to install for any heating dealer or electrician. Since the system is *electronic*, it has no moving parts—so there's nothing to wear out or break down. Once installed, service is negligible, which means you walk away from the job with your full profit.

Electronic Weathercaster. Mounted *outdoors*, it senses changes in the temperature—electronically—and sends signals inside to the Electronic Relay Amplifier.



Electronic Chronotherm. Mounted *indoors*, it senses changes inside the house—electronically—and sends signals to the Electronic Relay Amplifier. Provides automatic night set back, automatic morning pick up.



Electronic Relay Amplifier. "Interprets" signals from inside and outside controls, correlates and balances them, and sends them on to heating plant—giving ideal control.

Read what homeowners say:

Mr. Marlvan Sullivan, Atlanta, Ga., says:

"After one season with Electronic Moduflow in my home, I became one of its leading 'Drum Beaters' here in Atlanta. Nothing I've ever seen can equal its ability to give us real comfort—no matter what outside weather conditions are!"

Mrs. W. S. Cook, Covington, Ga., says:

"Time and again my friends have told me they notice a great improvement in the comfort of our home—now that we have Electronic Moduflow. I knew I'd noticed it—especially the elimination of cold drafts. But when friends comment—that's real proof."

Look *ahead*—look into this latest wonder in scientific heat control. Call your nearest Honeywell office for detailed information and application data today—or write Honeywell, Dept. AA-3-50, Minneapolis 8, Minn.

MINNEAPOLIS **Honeywell**

First in Controls

For Bigger Profits

WILLIAMSON
WARM AIR HEATING SYSTEMS

A Complete Line of Warm Air Furnaces

- For Gas, Oil, Coal and L. P. Gas
- Gravity and forced air types
- Hi-Boy, Lo-Boy, Counter-Flow and Horizontal Units

A Complete Line of Pipe and Fittings

Forced Air Duct Systems
- Reduction System Fittings
- Extended Plenum System Fittings
- Perimeter System Fittings
- Small Pipe System Fittings

Forced Air Fittings for:
- Floor
- Baseboard
- Sidewall
- High Sidewall

Gravity Fittings for:
- Floor
- Baseboard
- Sidewall
- Pipe, Elbows and Angles

All fittings die-cut and cartoned

National Advertising

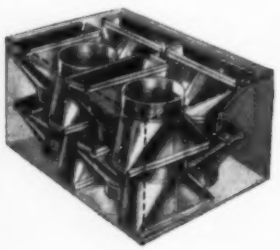
American Home
Better Homes and Gardens
House Beautiful
House and Garden
Living for Young Homemakers
Small Homes Guide
Successful Farming

Complete Line Catalog

A 104 page quick reference catalog on everything you'll ever need in furnaces and pipe and fittings. All under one cover.

Complete Line

Over 100 models of gas, oil, coal or LP gas fired furnaces are available for any size home, small or large, new or old. Attractive in appearance, efficient in operation and competitively priced—WILLIAMSON furnaces are designed for fast installation, dealer profit, and home owner satisfaction. A line of gas and oil conversion burners and coal stokers round out a product picture attractive to dealers interested in quality equipment purchases from one reliable source.



Like the equipment line, the WILLIAMSON Pipe and Fittings line is just as complete. There are Small Pipe systems, conventional size pipe and fittings, all *die-cut* for absolute uniformity and perfect fit. Zip-Slip joints make up tighter, straighter and faster than any other type. WILLIAMSON Pipe and Fittings are "packaged" in easy to handle cartons for warehousing, storing and quicker inventory taking. Time, labor and space are materially reduced with WILLIAMSON fittings.

WILLIAMSON dealers are backed by a complete hard-hitting national advertising campaign in the leading home publications—real live inquiries to follow-up.

WILLIAMSON dealers can find the product and data they want in one complete catalog covering equipment and pipe and fittings. No dozens of catalogs to thumb through

A WILLIAMSON Dealer is a PROFITABLE Dealer. Why don't you Join the Ranks Too?

THE WILLIAMSON HEATER CO.
3529 MADISON RD. CINCINNATI 9, OHIO

You get ALL these Features when you buy PET Drills!

Reserve Power—for the extra-tough job.
Powerful, Continuous-Duty Motors—built in PET's own factory. Dynamically Balanced Armatures—for freedom from vibration.
Six Heavy-Duty Ball and Needle Bearings.
Compact Design—makes hard-to-reach drilling jobs easier and faster.
Aluminum-Alloy Die Castings—for light weight, easy handling.
Forced Ventilation—for cool running.
Precision-Cut, Heat-Treated Gears—for smooth, quiet power flow.

If you want the *best* for your maintenance or production work, take an extra look at the PET Superduty Drill shown here. Check its features! Here's a drill that's made for heavy, continuous duty...with *plus* power per pound . . . built to *work* right and *handle* right on the job.

Normally you might expect to pay extra for such features—in the form of "optionals" that jack up your cost. But that's not true of PET Drills! All these features are standard in the PET Superduty line . . . *and they're available to you at a standard drill price!* That's why the coupon below can save money for you. For free catalog and name of your nearest PET distributor, *mail it today!*

NOW...you can get the RIGHT DRILL for YOUR job!

PET Superduty Drills are available in 54 distinct models and 3 capacities: ¼", ⅜" and ½". Your choice of pistol or saw-type grip. With such a broad line, you don't have to compromise on a drill that's "almost" right! You can choose *exactly* the drill you need for your job. The PET Superduty line includes drills meeting U. S. Government and military specifications.

PET® POWER TOOLS

Plus Power per Pound

PORTABLE ELECTRIC TOOLS, INC.

320 West 83rd Street, Chicago 20, Illinois

In Canada: Portable Electric Tools, Ltd., 452 Birchmount Road, Toronto 13, Ontario, Canada

MAIL COUPON FOR FULL INFORMATION

PORTABLE ELECTRIC TOOLS, INC. **AA-33**
320 W. 83rd St., Chicago 20, Ill.

Gentlemen: Please send us free copy of your PET Superduty catalog, and name of nearest distributor.

*Name*_____ *Title*_____

*Company*_____

*Address*_____

*City*_____ *State*_____

"My Michigan distributors and dealers like the

Viking '2300' HUMIDIFIER

because it installs easier and it's just about Fool-Proof."

says JOHN CARMAN
Earnest Viking Representative

Distributors and Dealers all over Michigan are turning to the Viking '2300' Humidifier

ERNEST H. BUCKERT, General Roofing Co., Inc., 4611 Berkshire, Detroit 24, Mich.

"It's easy to make money by handling the Viking '2300 Humidifier. Installation costs next to nothing because it takes only one man to install. You can be mighty sure I like that."

CHARLES M. CROSS, All Season Heating & Cooling Co., 25123 Plymouth Rd., Detroit 28, Mich.

"My customers are always pleased with the '2300'. Once it's installed they don't have to call back for service, and you can bet not having call-backs sure chops service expenses. You can't beat a Viking '2300' for trouble-free service."

CHAS. A. BUTTERFIELD, Home Improvement Service, 2899 W. Grand Blvd., Detroit 2, Mich.

"For a quick, money-making installation job a Viking '2300's the last word. Completely packaged, with everything included, it makes for a fast 20-minute installation job. This keeps the house neat and clean at all times while the work is going on."

MY WAREHOUSE COSTS ARE CUT TO THE BONE

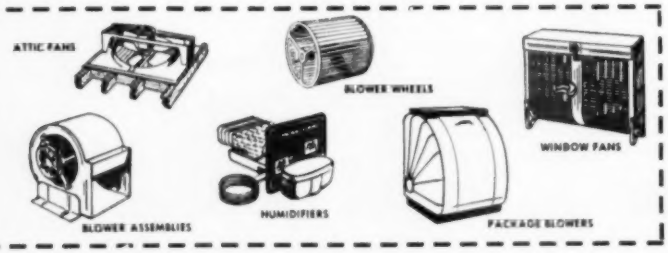
FRANK CHAMBERS, Superior Safety Furnace Pipe Co., 5820 Forsythe Ave., Detroit 2, Mich.

"The Viking '2300' cuts my warehouse costs to rock bottom. Because only one style fits all furnaces, we've been able to build a money-making business in humidifiers at a rock-bottom inventory cost. You can be mighty sure I appreciate not having to stock a lot of models and sizes."

Rx HEALTH BENEFITS OF VIKING HUMIDIFICATION

Humidity that is too high or too low "feeds" germs. With a Viking '2300' Humidifier you get just the right amount of moisture in the air to kill these germs. Proper humidification is a simple inexpensive way of stopping the spread of diseases like flu and pneumonia. It also helps relieve the discomfort of the common cold. Viking humidification is good for health as well as for comfort reasons.

Viking
AIR CONDITIONING CORP.
Cleveland 2, Ohio



New

...er source of profit
...ARMSTRONG furnace dealers

If you've been afraid to sell home air-conditioners because of complications of installation and service, ***now you can go ahead.***

The ***entire*** Armstrong refrigeration unit—compressor, cooling coil, condenser and accessories—is hermetically sealed. Installation means connecting the duct-work, electricity and water. No complicated refrigerant valves or adjustments.

Service after installation? The entire refrigeration unit is guaranteed by Armstrong for five years. In case of trouble you simply slide the unit out of its cabinet, ship it to the factory and slide in a replacement unit.

Complications? Not for you, in ***this*** summer air-conditioner.

It's made in two and three ton sizes, with or without blower. Amazingly compact—21½ x 24½ x 48¼", without blower, 62½" high with. So quiet you have to strain to ***hear*** it.

Its two-tone blue baked enamel cabinet makes it a twin to the beautiful Armstrong furnace line—but it can be installed at the same time as the furnace, or afterwards, or in connection with ***any*** good furnace.

Priced to sell, and with good margin.

Ask your Armstrong wholesaler for facts and figures, or drop a line to us for Specification Sheet S-34. ***Don't miss this profit-package!***

Wherever you are

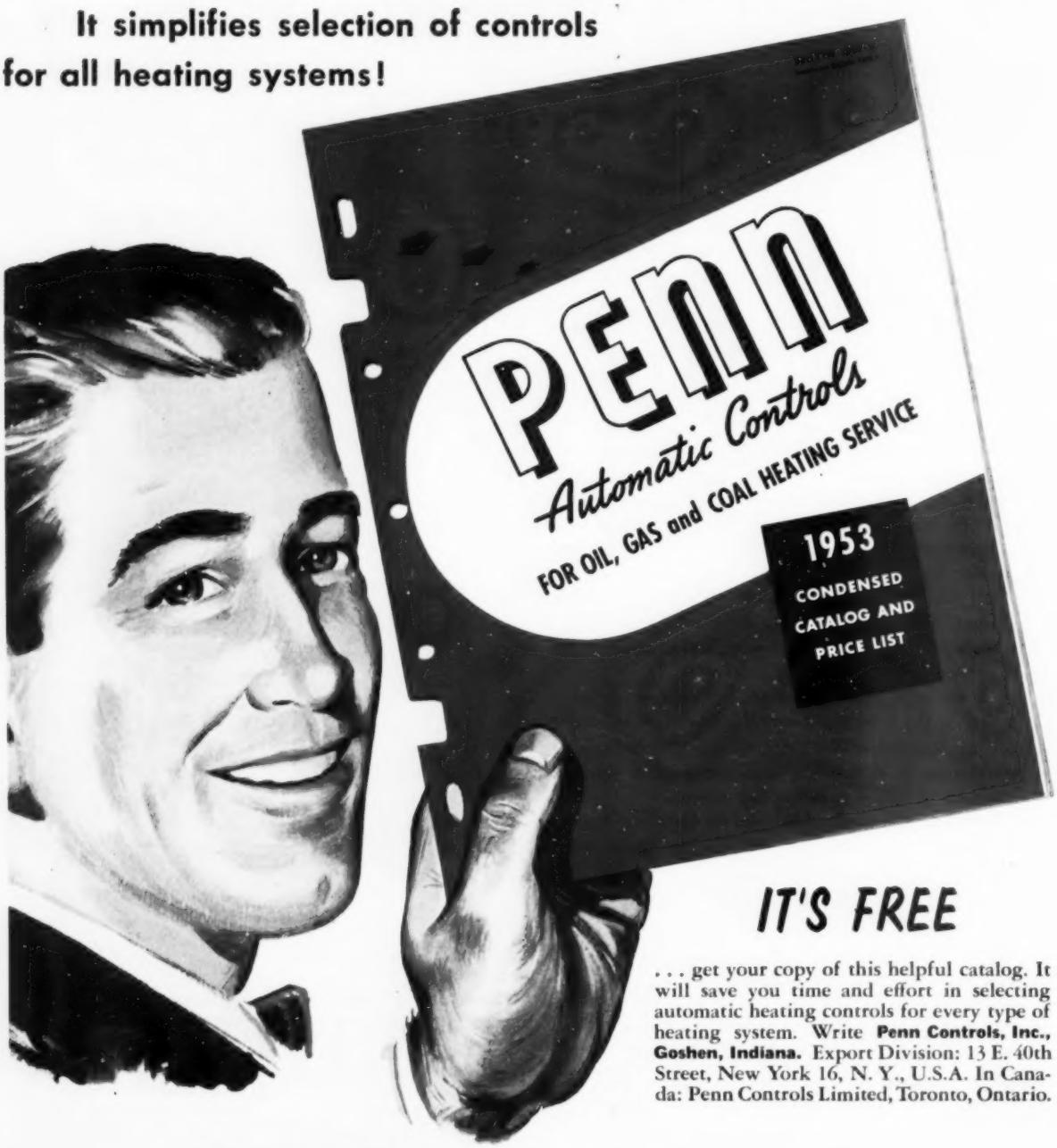
...U'RE ON THE ARMSTRONG M...

Please address Dept. AA at our plant nearest you.

ARMSTRONG
FURNACE COMPANY

NEW... JUST OFF THE PRESS

It simplifies selection of controls for all heating systems!



IT'S FREE

. . . get your copy of this helpful catalog. It will save you time and effort in selecting automatic heating controls for every type of heating system. Write **Penn Controls, Inc., Goshen, Indiana.** Export Division: 13 E. 40th Street, New York 16, N. Y., U.S.A. In Canada: Penn Controls Limited, Toronto, Ontario.

PENN

AUTOMATIC CONTROLS

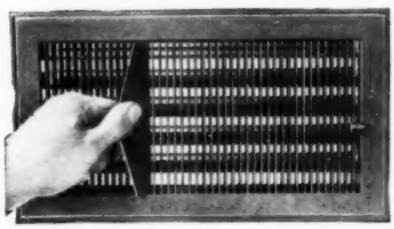
FOR HEATING, REFRIGERATION, AIR CONDITIONING, GAS APPLIANCES, PUMPS, AIR COMPRESSORS, ENGINES

AIR-CONDITIONING and PERIMETER REGISTERS and GRILLES

"GREATEST LINES ON EARTH"

Buy from a "Complete Line" Producer

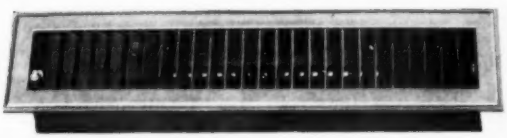
No. 256 Multiple-Valve Diffusing A-C Sidewall



The Leader of Superior Quality A-C Registers. Competitively Priced but Applicable to All Types of Installation. Sidewall — Baseboard — Ceiling. Vertical Diffuser Grille-Bars for Lateral Diffusion. Horizontal Lever Operated Rear Valves for desired Upflow, Downflow and Volume Adjustment.

No. 410 U. S. Diffuser FLOOR REGISTER

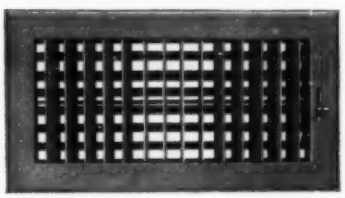
For Perimeter Systems Also 4"-4½" Small Pipe Systems



Deflecting Grille — Bars are spaced at Graduated Degrees of Deflection to Blanket outside walls and Glass Surfaces with Air-Stream. Valves may be Locked to control Air Volume.

"THEY REALLY SPREAD THE AIR"

No. 190 SERIES—That "WONDER LINE" of U. S. Multi-Flex Registers and Grilles



"INDIVIDUALLY SET" DOUBLE STREAMLINED GRILLE BARS LEVER OPERATED — Key Operated. Removable Lever Operator. No. 200 SERIES NONFLEX REGISTERS and GRILLES with "FIXED" GRILLE BARS designed for Return Air to match.
No. 190 SERIES
YOU COULD NOT CONCEIVE THE SUPERIORITY OF No. 190's and 200's without comparing them with other lines.

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UNITED STATES REGISTER COMPANY

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MINNEAPOLIS • KANSAS CITY • ALBANY

SOLD BY LEADING JOBBERS FROM COAST TO COAST

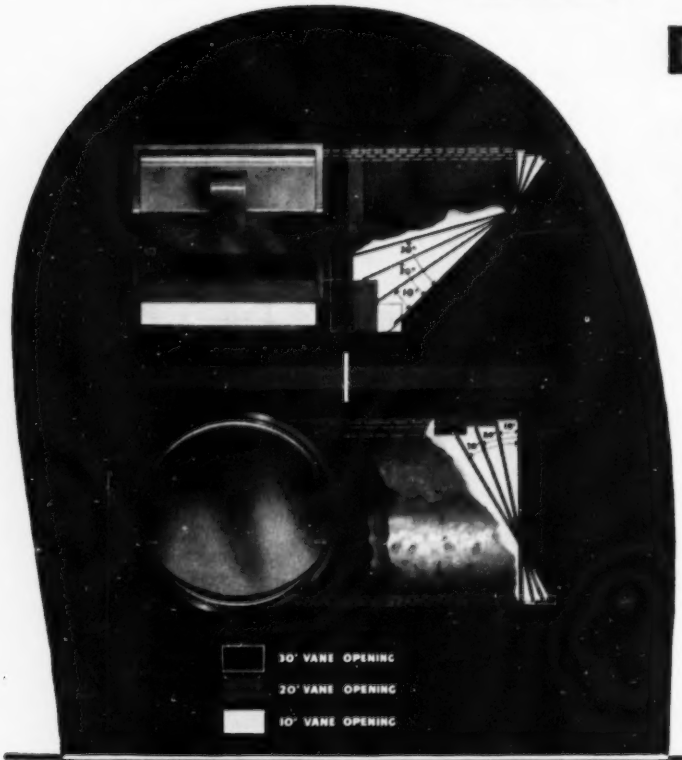
how draft looks at Draft Controls

(as a relief valve)

The primary purpose of a draft control is to act as a relief valve for excessive drafts. That's why it will pay you to study the advantages of a square body and angular mounted vane.

Look at draft controls the way draft looks at them and you'll see why Windmaster offers important exclusive advantages for increasing heating efficiency and improving oil burner performance.

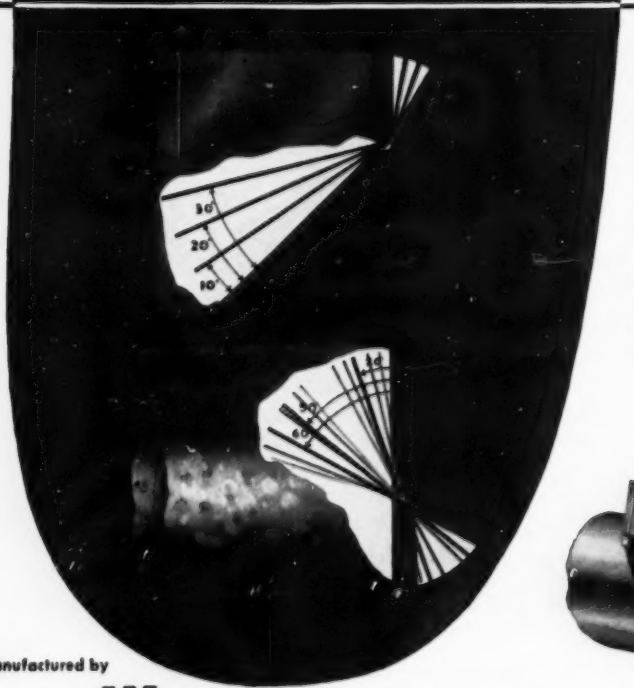
Front view of the Windmaster Draft Control and a round draft control compares the free area available for relieving draft, and illustrates the marked advantages of



Windmaster's generous free area

OPEN VANE:	6" WINDMASTER GIVES YOU:	6" OTHER CONTROL GIVES YOU:
10°	3½ sq. in.	1½ sq. in.
20°	9 sq. in.	3 sq. in.
30°	14 sq. in.	4½ sq. in.

The greater the free area — the more rapid is relief and the more efficient is the heating unit performance



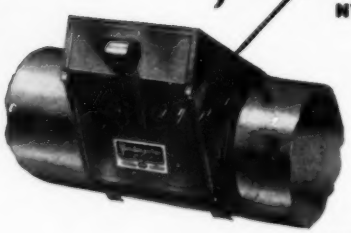
Profile views of the two controls show the great difference in distance of vane travel. The familiar nervous quiver of the vertically mounted vane and the longer travel time means *lag-time* — a problem eliminated by Windmaster's quick, steady control of draft.

TO PROVIDE IN FREE AREA	6" WINDMASTER MUST OPEN	6" ROUND, VERTICALLY MOUNTED VANE MUST OPEN
3 to 3½ sq. in.	10°	20°
9 sq. in.	20°	50°
13 to 14 sq. in.	30°	60°

Another Windmaster Exclusive

Jeweled Movement

NYLON BEARINGS



- Permanently Silent
- Outwear Steel
- Float Free From Friction
- Immune To Corrosion
- Unaffected By Temperature Changes
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Manufactured by

Windmaster Corporation

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Send For "The Windmaster Story" Today

Windmaster Draft Control

SEQUOIA

guarantees quality in gas furnaces where it counts most

Quality in the finished product is just half the story — SEQUOIA knows a quality *after-sale* policy for its heating dealers is important, too. That's why Sequoia always uses the finest parts and materials obtainable.

RATED PERFORMANCE. Sequoia engineering know-how gets maximum performance from GE blower motors, General and M-H controls, Dust-Stop filters and other first-rated parts. They help Sequoia *Horizontals* (5 sizes, 70,000 to 150,000 BTU) and *Closet'eers* (7 sizes, 65,000 to 200,000 BTU) do a top-notch heating job every time.

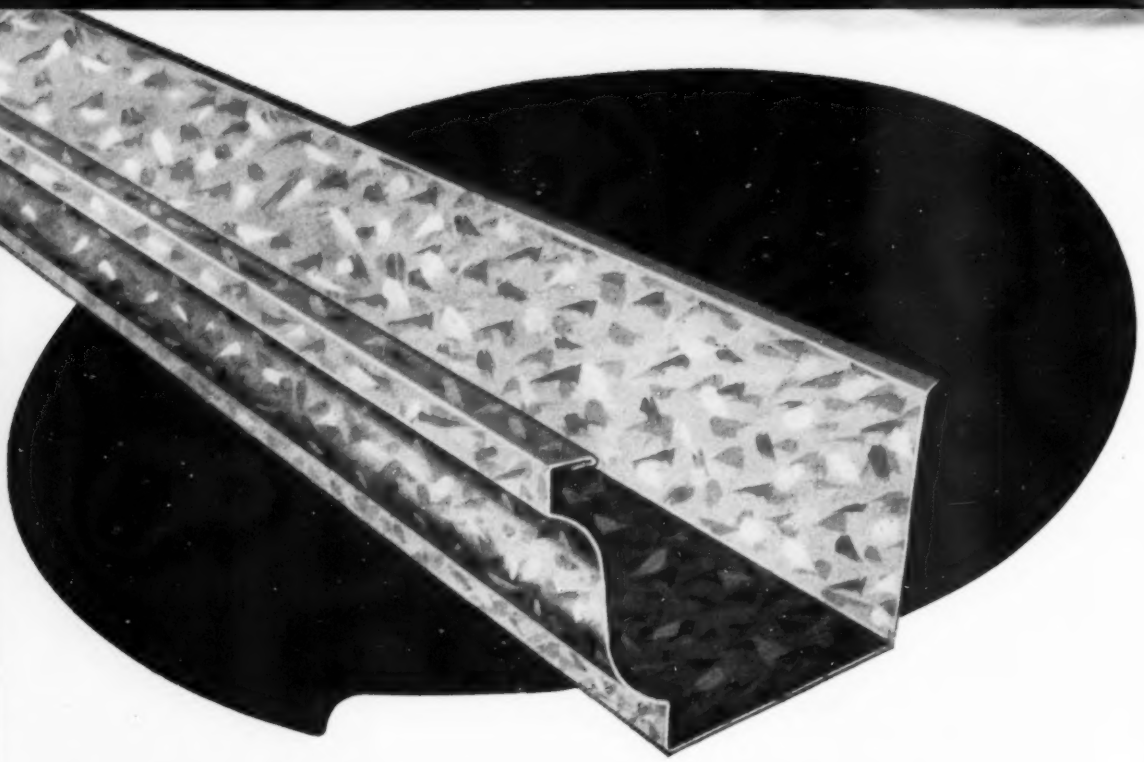
GUARANTEED PERFORMANCE. Service problems do occur, with any make furnace. When they do, Sequoia dealers know they can restore their customers' heating facilities quickly and with minimum effort and expense. Why? These accessory parts, because they are of standardized highest quality, are readily available in principal localities throughout the nation. They cost Sequoia more, of course. But to assure its dealers of an immediate and nearby source of supply for key components is another important feature in Sequoia's *after-sales* policy!

If an outstanding factory *after-sales* policy is important to you, too — information regarding a SEQUOIA dealership may be obtained from:

SALES DEPARTMENT

SEQUOIA MANUFACTURING CO.

1000 BRITTAN AVENUE • SAN CARLOS 3, CALIFORNIA



You spend fewer hours on the job, erecting

*MILCOR** Style K Box Gutter

MILCOR Style K Box Gutter gives you a more profitable job and one you can be proud of. Features like these help *you,* and assure *your customer* complete satisfaction:

Flat hemmed edge adds strength and rigidity — is safe and easy to handle.

Beveled edge provides spring fit against facia board.

Bead at bevel keeps back of gutter straight and true.

Uniform accessories assure a permanent tight-fit.

Milcor Style K Box Gutter is furnished in 4", 5", and 6" sizes — standard or high back — as shown in Milcor Catalog No. 500. If you don't have a copy, write for it on your business letterhead.

*Reg. U. S. Pat. Off.

S-112

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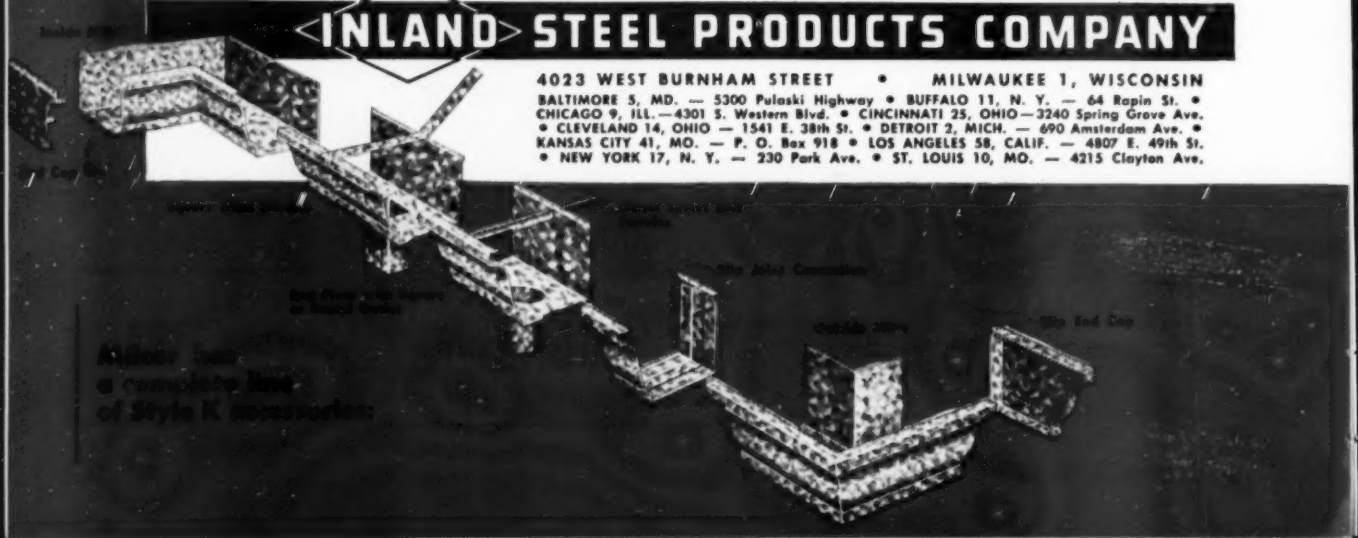


News Round-Up

PAD Rescinds Gas-Limit Order

BECAUSE THE DEFENSE needs of the nation for natural gas are now being met, the Petroleum Administration for Defense rescinded its order No. 2, effective March 1, Deputy Petroleum Administrator J. Ed Warren announced recently. Revocation of the order, which slowed down extensions of natural gas uses in some areas over the past 19 months, does not mean that plentiful supplies of gas are available in all areas for all who might want to use it, Mr. Warren emphasized.

"While there are adequate supplies of natural gas underground for all foreseeable needs of the near future," he said, "pipeline facilities to get the gas to points of use in some areas are still not entirely adequate. As clearly demonstrated in PAD's recent *Gas Requirements and Supplies of the Gas Utility Transmission and Distribution Industry* report, the potential demand for natural gas in some areas will continue to be more than available supplies for some time. This is particularly true of certain areas in the Appalachian and Great Lakes regions. It is apparent from our studies that some local controls over extensions of natural gas use will probably have to be retained until the gas industry is able to provide adequate supplies to meet all demands."

Plan to Serve More Natural Gas Markets

THE FEDERAL POWER Commission has granted permission for Pacific Northwest Pipeline Corp., Houston, to file a third substitute application in connection with its plan to construct a natural gas transmission system extending from the San Juan Basin in New Mexico and Colorado to market areas in the Pacific Northwest.

The corporation's project, as now proposed, would include 1466 miles of main line, 380 miles of spur or lateral lines, and 16 compressor stations with a total of 104,420 hp. The project, which would have a capacity of 343 million cu ft of natural gas per day, is estimated to cost $186,000,000 including $2,000,000 for working capital.

The company proposes to serve markets in Washington, northern Oregon, Idaho, Utah, Wyoming and Colorado, and also to sell gas to Colorado Interstate Gas Co. of Colorado Springs. Proposed direct industrial customers include the Atomic Energy Commission's plant at Hanford, Wash.

In addition, the El Paso Natural Gas Co. of El Paso, Tex., has applied to the Commission for authority to construct new pipeline facilities which would carry an additional 400 million cu ft of natural gas per day from points in west Texas, southeast New Mexico and the San Juan Basin area of northwest New Mexico for delivery to customers in New Mexico, Texas, Arizona and California.

The project, estimated to cost $175,250,000, will include a total of 1778 miles of pipeline and 161,860 compressor horsepower capacity. The proposed new facilities would permit the delivery of an additional 300 million cu ft of gas per day from the Permian Basin in southeast New Mexico and west Texas, and an additional 100 million cu ft daily from the San Juan Basin in northwest New Mexico and southwest Colorado. The gas would be for use by the Southern California Gas Co. and the Southern Counties Gas Co., Los Angeles; the Pacific Gas and Electric Co., San Francisco; and other customers in west Texas, New Mexico and Arizona.

Atmosphere No Longer for Waste Disposal

"UNTIL RECENT YEARS, the atmosphere was considered a natural means of waste disposal. Almost without exception homes, schools, small and large industries, alike, discharged their furnace gases with all the products of combustion into the atmosphere. With the increase in population and concentration of industry, this practice cannot be continued without deleterious effects," said Bert S. Norling, du Pont engineer, at the ASME's anual meeting.

Warm Air Heating Manuals Revised

THE NATIONAL WARM AIR Heating and Air Conditioning Association has revised four of its design and installation manuals. The revised manuals are Manual 3 — *Calculating Heat Losses*, Manual 4 — *Warm Air Perimeter Heating*, Manual 7 — *Code and Manual for the Design and Installation of Warm Air Winter Air Conditioning Systems*, and Manual 10 — *Small Pipe Warm Air Perimeter Heating*. These new editions supersede the previous ones.

One of the important additions to Manual 3 is the heat loss factors for milder climates. These factors are for areas where the design temperature difference between outdoor and indoor temperatures is from 30 to 45 F. Also included in the fourth edition are heat trans-

News Round-Up

mission coefficients for newer types of wall constructions found in many of today's modern homes. These include the use of plywood and drywall construction for interior finishing of the walls.

Manual 4 has been brought up to date with the recent findings from the research work conducted at the University of Illinois and from the association's field investigation program. Of major importance has been the addition of design and installation recommendations on the use of low-wall diffusers. The perimeter heating worksheets have also been revised for use with the new third edition of this manual.

As a means of simplifying the use of Manual 7, the capacity tables and the sizing tables have been combined in the revised edition. This will facilitate the sizing of registers, stacks, branch ducts, and trunk ducts. Added to this new edition is information on the design and installation of the extended plenum when used with winter air conditioning systems. This is the fourth edition of this manual.

Changes in Manual 10 include the provisions for the introduction of outside air into the system where air is not returned from the area to be heated, such as a basement. In conjunction with this section, a new table has been added indicating the required increase in Btu per hr capacity of the furnace when varying amounts of outside air are introduced into the system. Another section has been included covering baffling the plenum on the individual pipe system, which is sometimes necessary in order to even out air temperatures entering individual leaders.

Prices of these new editions are as follows: Manuals 3 and 4, $1.00 each, Manuals 7 and 10, 75 cents each. Copies of the new editions and a new publications order form, listing all publications and prices, can be obtained by writing to the association, 145 Public Square, Cleveland 14.

Wage Adjustments Effected

CHARLES C. KILLINGSWORTH, chairman of the Wage Stabilization Committee, said recently that the adjustments proposed in approximately 9200 petitions pending before the agency can now be placed in effect under the executive order issued by the President suspending wage controls.

The 9200 petitions pending in Washington and the 14 regional offices of the agency involved changes in wage rates, and adjustments in so-called "fringe benefits," such as vacations, holidays and shift differentials, and pension plans. In addition, adjustments proposed in some 1500 pending health and welfare reports can be placed in effect.

Mr. Killingsworth said the President's executive order does not constitute blanket approval of all pending cases but states that employers are now free to make the changes in compensation proposed in the petitions. "Some contracts contain clauses saying they are dependent on Wage Stabilization Board approval," the chairman said. "Where such clauses are contained in agreements submitted to the agency, the executive order validates them and they have the same legal standing as if they had been approved. This applies to all pending cases, including appeals from prior decisions of the board or its regional offices. Where the proposed adjustment is made retroactive, it can be placed into effect as of the proposed effective date," he said, and also stressed that the executive order does not rescind modifications or denials in petitions made during the life of the wage stabilization program.

U. S. Will Need 33 Million Homes

AMERICA IS faced with a requirement of over 33 million housing units during the next two and a half decades, General John J. O'Brien, president of Gunnison Homes, Inc., told 400 dealers at a recent meeting.

"This results directly from the tremendous increase in population," he said. "In 1937, according to a Congressional committee report just issued, our population was expected to increase to the extent of 900,000 persons per year over the next decade and a half. Today, the most conservative opinions place the average annual population increase at twice that figure. In other words, the population in 1960 will reach 175,000,000 people and, based on the same rate of increase, we double our population in the next 50 years.

"Acceptable figures established 3.5 persons as the average family unit in this country, and based on the anticipated increase in our population we will require 20,000,000 new housing units to care for this expanding population in the next 25 years. In addition, we must take into consideration the need for 13,500,000 additional units for replacing existing units which will have exceeded their useful period and for the replacement of loss through fire, disasters and the like. We are, therefore, faced with a requirement of 33,500,000 housing units during the next two and a half decades."

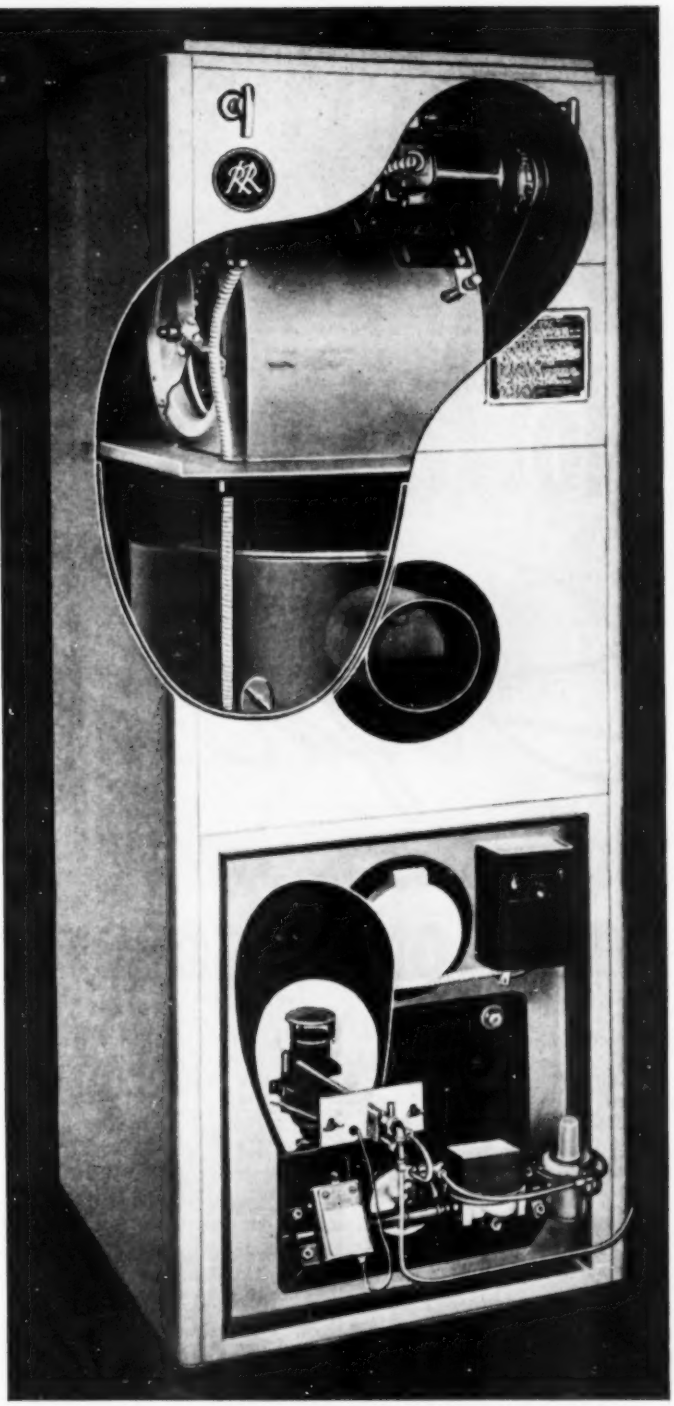
RICHMOND SR-G

A profitable addition to your gas heating line

Here's a brand-new steel winter air conditioner —the Richmond SR-50-G—that's ideal for heating basementless homes with panel or sub-floor duct systems. This latest addition to Richmond's modern heating line fits easily and compactly into alcove, closet or utility room.

The Richmond SR-50-G is a fully automatic, factory-assembled counterflow unit with a 85,000 BTU/hr. input . . . a 12 gauge steel heat exchanger . . . a smart, light green hammertone casing . . . AGA approved. It is also available with oil burner controls (SR-50-P).

Quality-engineered with customary Richmond precision...designed to deliver maximum heat at minimum cost, the SR-G provides your customers with an outstanding value . . . provides you with a sure-fire seller.



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It pays to push Richmond

See your wholesaler or Mail Coupon Today

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Please send me additional information on the new Richmond SR-G counterflow unit. No obligation, of course.

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SELF-TAPPING SCREWS

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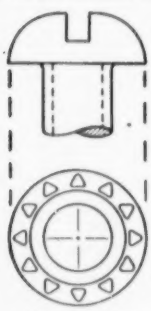
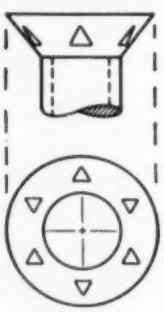
For Your Protection

NON-COUNTERSUNK HEADS



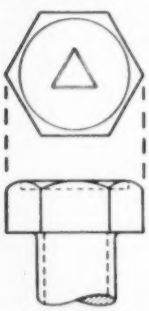
12 IMPRESSED TRIANGLES UNDER HEAD

COUNTERSUNK HEADS



6 IMPRESSED TRIANGLES UNDER HEAD

HEXAGON HEADS



1 EMBOSSED TRIANGLE ON TOP OF HEAD

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TRADE MARK REG. U.S. PAT. OFF.

Signed Like the hall mark on fine silverware, this triangle mark now impressed on all P-K Self-tapping Screws signifies the maker's pride of craftsmanship. This "signature" will serve for your protection against substitution.

Certified Now, the P-K triangle mark will certify every screw that bears it as a genuine Parker-Kalon Product, made by the *originators* of Self-tapping Screws. Now, you can be sure, when you see this mark, that you are using the *only* Self-tapping Screws made with the accumulated "know-how" of 40 years of enterprising leadership.

Guaranteed Now, identification goes beyond boxes or other containers and labels. The screw identifies itself, and when you see the P-K triangle mark you know it is the *guaranteed* screw, backed by the "Guarantee of Highest Quality" printed on every box. Look for the P-K triangle on the screws you buy and use. It's your one sure way to guard against job-slowing, parts-wasting screw failure . . . the way to make *planned* assembly savings *pay off*.

Parker-Kalon Corporation, 200 Varick St., New York 14.

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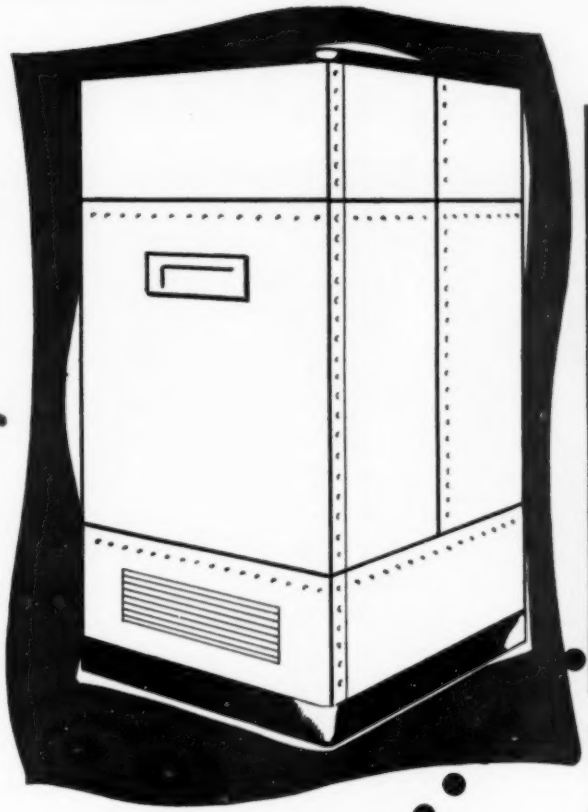

WHEN YOU CAN SELL HEIL *Automatic Heat*

It's Easier to Sell the Smartest, Neatest Line in the Industry

If you're trying to sell bulky, awkward, outmoded heating units, why try longer? Why not sell the newest in heating—HEIL Automatic Heat. HEIL's neat, compact units are styled to appeal to your customers, designed to save space in their homes.

More than that, HEIL Automatic Heat can give them better heating for less money, and you yourself can prove it to your prospects, *easily*. When you show them HEIL's greater heating surface, HEIL's designed- and built-together burners and units, they can see why HEIL gives them better value—why HEIL units can give them more uniform heat and still save fuel.

You can make more money with HEIL. HEIL is easier to sell, because it's the newest thing in heating. HEIL units are factory assembled and wired, so you save time and money on installation. HEIL engineering and HEIL quality construction mean less servicing, and faster service calls when you get them. Why not get the facts and start selling HEIL. It's the easier way to more money in heating!

THE HEIL CO.

HEIL Automatic Heat is sold through distributors.

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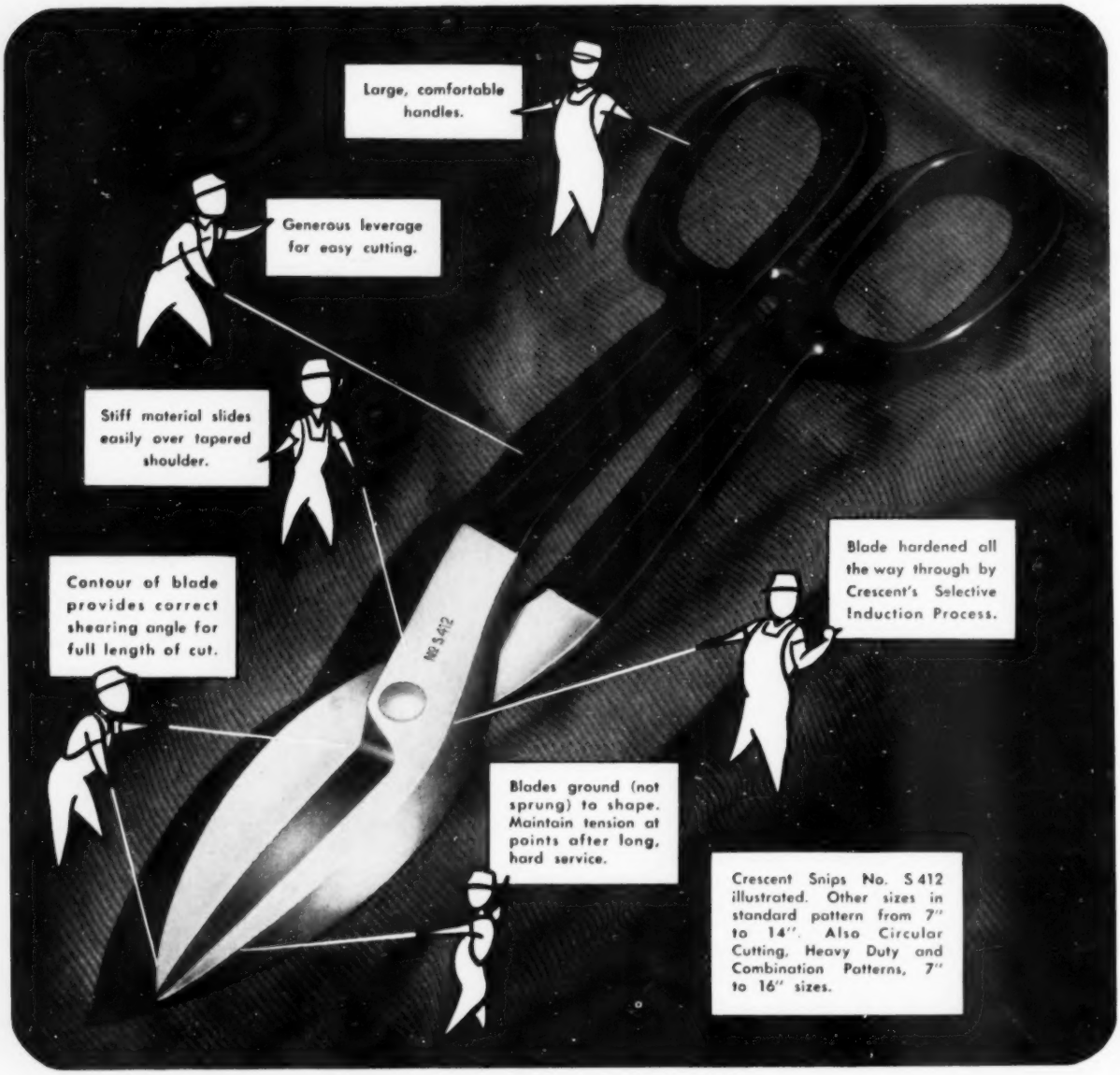
Oil-Fired and Gas-Fired Winter Air Conditioners

Oil-Fired and Gas-Fired Highboys

Oil and Gas Conversion Burners

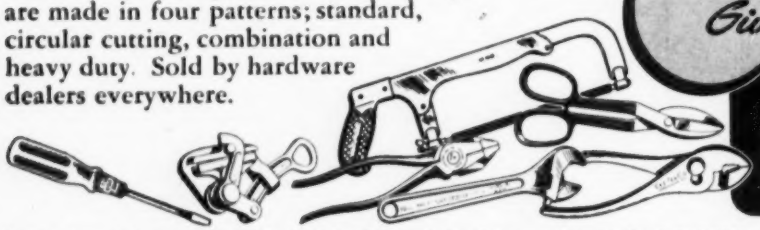
Oil-Fired and Gas-Fired Boilers

Why Craftsmen prefer CRESCENT SNIPS


Large, comfortable handles.
Generous leverage for easy cutting.
Stiff material slides easily over tapered shoulder.
Contour of blade provides correct shearing angle for full length of cut.
Blade hardened all the way through by Crescent's Selective Induction Process.
Blades ground (not sprung) to shape. Maintain tension at points after long, hard service.
Crescent Snips No. S 412 illustrated. Other sizes in standard pattern from 7" to 14". Also Circular Cutting, Heavy Duty and Combination Patterns, 7" to 16" sizes.
No. S 412

● All Crescent Snips are forged of selected steel and blades ground on special grinding machines. They are hardened by Crescent's own selective induction process to insure long satisfactory service. These easy-cutting, well-balanced snips are made in four patterns; standard, circular cutting, combination and heavy duty. Sold by hardware dealers everywhere.

CRESCENT TOOLS
Give Wings to Work ®
Sign of the Artisan
Symbol of Excellence



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CRESCENT TOOL COMPANY, JAMESTOWN, NEW YORK

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A skyline of chimney pots was a striking sight in the 1890's . . . and a sign of heating inefficiency.

Compare the fireplaces and stoves of that day with modern central heating plants. Today's furnaces are marvels of efficiency in converting gas, oil and coal into clean, even heat that reaches every room.

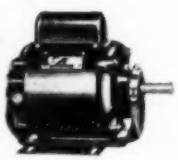
Ever since 1908, when a furnace blower powered by an Emerson-Electric motor was introduced, we have been designing and producing motors for mechanical-firing and air-moving heating units. Many of the most famous names in the heating industry depend on Emerson-Electric motors for efficient, long-life operation for their products.

Ask us about Standard Motors in ratings from 1/20 to 5 H.P., and Hermetic Motor parts from 1/8 to 20 H.P.

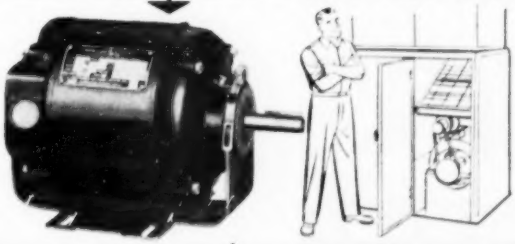
Write **THE EMERSON ELECTRIC MFG. CO., St. Louis 21, Mo.**

MODERN LIVING IS POWERED WITH ELECTRIC MOTORS

EMERSON-ELECTRIC MOTORS
For Belted Fans and Blowers



These motors incorporate all the electrical and mechanical specifications best suited for this service. Split-phase motors, available in 1/6, 1/4 and 1/3 h.p., with resilient mountings and automatic reset thermal protectors. For complete data write for Motor Bulletin No. M183.



EMERSON ELECTRIC
MOTORS • FANS APPLIANCES

LEADERS IN THE MOTOR AND FAN INDUSTRY SINCE 1890

with the new, low cost

PERFEX DAY-N-NITE CONTROL

ONLY $22.70* Retail plus nominal dealer installation charge

SET No. 141 • Just Install On Any Existing Automatic System

No need to disturb present thermostat. Set consists of one Magic Dial Thermostat for installation in sleeping area and Automatic Day-N-Nite Time Switch installed in basement or utility room which controls both thermostats. NO FEDERAL TAX.

**Price subject to change without notice*

Now every home, new or old, can have true heating comfort (not mere night set-back) with living and sleeping areas independently regulated, at a price within reach of *every* home owner.

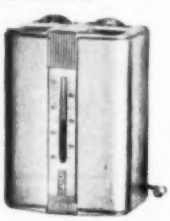
The new Perfex DAY-N-NITE Control employs TWO thermostats — the existing thermostat now installed in the living area for daytime regulation and the new Perfex Magic Dial thermostat installed in the sleeping area for night time regulation. Each thermostat operates independently when switched on and off by an Automatic DAY-N-NITE Time Switch installed in the basement or utility room. Thus each area is controlled separately, resulting in more accurate, more comfortable temperature 24 hours a day.

And what's very important — the DAY-N-NITE Control costs so very little, *every* home owner can afford it — presenting a vast potential market.

PERFEX

Perfex Corporation, Milwaukee, Wis.
In Canada, Perfex Controls Ltd., Guelph, Toronto 1

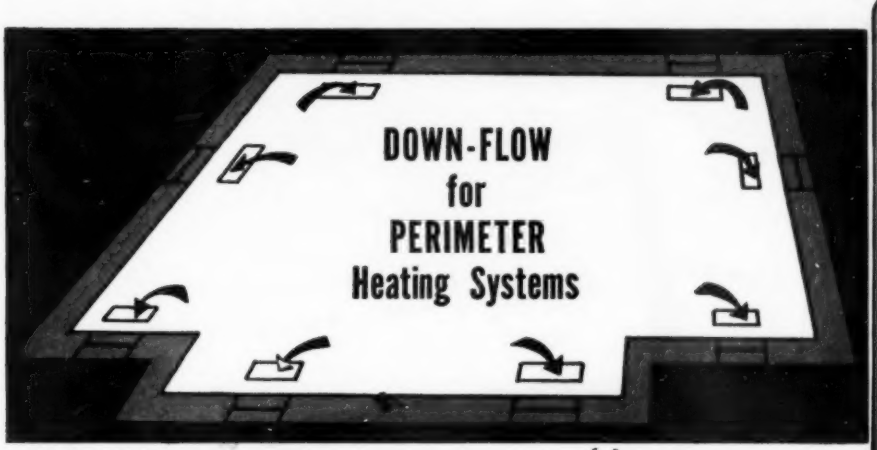
AUTOMATIC CONTROLS FOR HEATING • AIR CONDITIONING • APPLIANCES



Famous, exclusive Perfex Magic Dial Twin Thermostat also available for DAY-N-NITE Automatic Time Switch No. 140.

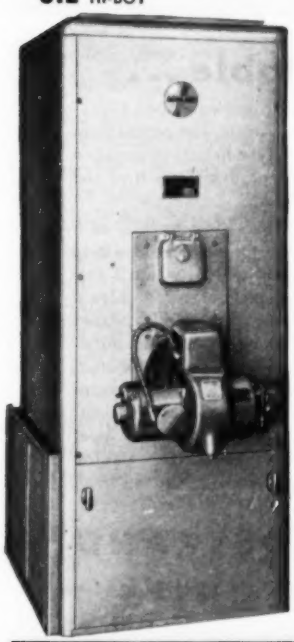
WINTER AIR CONDITIONING at its BEST!

Activated Heat WITH warm air NIAGARA FURNACES



GAS Model 40-80 DFAC DOWN-FLOW

OIL Model 30-90 DVAC HI-BOY



. . . and conventional "up-flow" Hi-Boys . . .

Long noted for dependable and efficient service—supplying maximum heat at minimum cost—Niagara furnaces are fast gaining fame also as maximum profit-makers for heating contractors.

The Niagara line, greatly enlarged to meet all modern residential heating requirements, now includes:

GAS — Basement and utility-room models . . . Down-Flow and conventional "up-flow" Hi-Boy units (steel) . . . also the famous Deluxe "Thrifty 50" with the exclusive, efficient Niagara cast-iron heat exchanger—forced air and gravity.

OIL — Down-Flow and conventional "up-flow" Hi-Boy models and basement-type forced-air and gravity units (steel).

COAL — Complete winter air conditioners and round and square gravity furnaces (cast-iron).

SIZES FOR LARGE, MEDIUM AND SMALL HOMES

For detailed information on the profit opportunity with Niagara, write:

NIAGARA FURNACE DIVISION
The Forest City Foundries Company
2500 West 27th St., Cleveland 13, Ohio

NIAGARA is the word for MAXIMUM HEAT at MINIMUM COST

Two new data bulletins now available...

TWO BASIC MODELS SOLVE ALL FUEL UNIT PROBLEMS

Model "J" Single-Stage and Model "H" Two-Stage . . . for 3, 6, 10, 14, and 20 Gph firing rates . . . Strainer capacities — 6, 10, 15, 20 Gph . . . Solenoid Valves optional on factory assemblies only . . . Interchangeable with Sundstrand Models S-1, R, J, or K.

INDIVIDUALLY TESTED AND CERTIFIED

● In these two multi-color bulletins you can get the complete story on Sundstrand Fuel Units for *all* replacements.

Bulletin No. 1106 covers Model H, the two-stage unit which is available with or without solenoid. The bulletin shows you why this model is best for long line and high lift applications, how the oil flows through the unit, how the valve operates, points out the outstanding features of Sundstrand's design, gives you dimensions and complete specifications.

Bulletin No. 1102-1 covers Model J, the single-stage unit with or without solenoid. Here, again, you get the complete story—all the helpful information you need for specifying this tried and proved fuel unit.

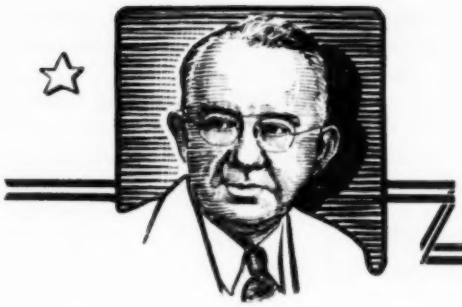
With these two basic models, each available in five popular sizes, you have simple, efficient solutions to all new equipment or replacement problems. You have the exact capacity, exact mounting arrangements for every installation. And you know you will be offering your customer the finest-performing fuel units on the market—efficient, trouble-free operation, supremely quiet operation, and longer life. Get your *free* copies of these new data bulletins now!

SUNDSTRAND

SUNDSTRAND FUEL UNITS

SUNDSTRAND MACHINE TOOL CO.
HYDRAULIC DIVISION, ROCKFORD, ILL.

Made in Canada by John Inglis, Ltd., 14 Strachan Ave., Toronto



Arnold Kruckman's

Washington Letter

How to Get on Lists to Bid on Government Contracts

THE DEFENSE DEPARTMENT has accumulated $101 billion since the Korean emergency began. The 1953-54 budget will supply the additional sum of $50 billion for defense. This total of $151 billion is expected to be spent between the present time and 1955, perhaps 1956. To be perfectly sure there can be no misunderstanding of these figures, it is proper to record that some of the senators following Senators Taft and Byrd will try to reduce the 1953-54 budget by $10 billion. This would still leave the incomprehensible and almost incredible aggregate of $141 billion. It is also proper to record that those most closely attuned to the plans of the White House feel there will be little reduction in defense appropriations. The expenses in Asia will mount appreciably. Whatever minor reduction may be accomplished might be made in Europe.

However that may be, the important fact is that hundreds of millions of dollars in that colossal total will be spent for those products that are made or sold or serviced by the readers of the American Artisan. The many plans and needs of the defense program include innumerable heating units of every known type. There is need for warm air furnaces of all kinds. Great numbers of cabinets and casings will be required, along with prefabricated chimneys, controls and control systems, various types of fans, air filters, fittings and accessories, flashings, unit heaters, humidifiers, insulation, louvers and shutters, sheet metal roofing, metal stampings, ventilators and ventilating systems, and hundreds of other different items sold or made or supplied by the contractors of the industry.

Also bear in mind that the civilian part of the budget totals between $20 and $30 billion. It is considered reasonable to assume that several billions will be spent in the building construction activities in which the federal government is involved. There is, for instance, the Defense Homes Corporation which has spent fabulous sums, and there is the Defense Plant Corporation, which is expected to become very active when the shadow plant program is put into action. And there is the Farmers Home Administration which is spending hundreds of millions of dollars in building programs. Then there are the Federal Housing Administration, the Federal Public Housing Authority, the Home Owners' Loan Corporation, and other government units, all of which, in some manner, engage in building construction. Aside from the construction which the various federal civilian agencies do for the service of the government itself, the greatest expenditure of their time and money is devoted to housing and industrial and business construction.

It is important to the readers of the American Artisan to get well acquainted with what the defense agencies and the civilian agencies plan to do. There is business in those agencies. Several readers of the American Artisan have told this reporter that both directly and indirectly they have secured an amazing amount of business that either is related to defense or comes from the civilian federal agencies.

Apparently the difficulty many businessmen encounter is lack of "know-how". They don't know where to turn to for the information, and they don't know where and how to bid on this kind of business; or they don't know how to arrange to get in line for sub-contracts and sub-sub-contracts. Those who have some understanding of the approach to goverament business begin to realize that virtually every agency of government, at some time or another, buys some of the things they make, sell or contract to install or supply. No matter how fantastically remote the purposes of the agency appear to be, it is the experience of a great number of businessmen that such agencies have multifarious facets and have surprisingly numerous needs for the many things that

come out of the national economy. The cue, therefore, — if you really want government business — is to establish relations with almost every agency in the defense and the civilian sectors of the government. That is not as difficult as it sounds.

Should Contact General Services Administration

It is usually done this way. Each agency (and often the different divisions or sections or parts of a specific agency) has procurement officers. These officials are listed under different titles. You write to the appropriate officer, or office, and ask to be advised how you can qualify for a listing on the bidders' lists. For instance, suppose you write to the General Services Administration. This agency buys something for practically every defense and civilian agency of the federal government, but it does not buy everything for all these agencies. It appears, however, that GSA gradually will become the over-all wholesale purchasing agent for the federal government.

You write to the GSA by addressing the Business Service Center, General Services Administration in the region where you are located. There are 10 such regions. Region 1 is found at Boston 9, in the Post Office and Court House; Region 2, 250 Hudson Street, New York 13; Region 3, 7th and D Streets, S. W., Washington 25, D. C.; Region 4, 50 Whitehall Street, S. W., Atlanta; Region 5, Court House, 219 South Clark Street, Chicago; Region 6, Federal Office Building, Kansas City, Mo.; Region 7, 1114 Commerce Street, Dallas 2; Region 8, Building 41, Denver Federal Center, Denver; Region 9, 49 Fourth Street, San Francisco 3; and Region 10, Federal Office Building, Seattle. If you wish to be certain in which region you are located, write the Business Service Center, Washington, D. C., or write to the American Artisan.

Application Calls for Answers to Various Questions

In reply to your letter to the Business Service Center, you will receive what is called a mailing list application. Its formal identification is Form TS 705, Rev.-July, 1949; Budget Bureau No. 48-R098.5. The blank requires that you state your name, the address to which the bidding forms are to be mailed, the address of the main business office, the shipping point, and the names of the person or persons authorized to sign bids and supervise all matters concerning the bids and contracts. Then you are asked if you are a manufacturer within the meaning of the following definition: "A manufacturer owns, operates or maintains a factory or establishment that produces on the premises materials, supplies, articles or equipment." The next question asks if you are a wholesale dealer within the meaning of the following definition: "A wholesale dealer owns, operates or maintains a warehouse, or other establishment into which materials, supplies, articles or equipment are brought, kept in stock and sold to retail dealers." If you are neither a manufacturer nor a wholesaler, you must state the nature of your business.

The blank also warns you that if you fail to respond to any invitation to bid (by not bidding or by not replying) your firm will be removed from the mailing list for the class of commodities involved. There are 24 pages to the mailing list application. All but one page are devoted to details of the 103 classifications in which fall the usual supplies and services procured by General Services Administration.

Agency Represents Smaller Business

It is absolutely true that the Small Defense Plants Administration is the strongest influence and the most energetic representative smaller business has in government procurement. It will be sound sense and practice for any reader of the American Artisan who wishes to do business with the government to establish relations with the SDPA. This is the way to do it. SDPA has a section known as the Office of Contract Procurement headed by Charles Swisher, director. But the man with whom to establish personal relations is D. R. Farthing, who has been doing such an outstanding job that many smaller business organizations, and innumerable smaller business men, depend on him as their last resource in all problems that may arise.

Suppose you are bidding on a government job. It may be wise to talk over the bid procedures with Mr. Farthing before you do it, or to get in touch with him when you have made your bid. He can tell you what you should do and what you shouldn't do, and probably he can follow the fate of your bid until a determination is made.

In every procurement center of the defense agencies there are procurement specialists of SDPA. Mr. Farthing works with these men, and these men work with the defense agency procurement officers. Between them they can maintain a clear picture of what is happening to any specific bid. The efforts of Mr. Farthing and his associates up to this time have caused the various agencies to set aside an aggregate of $310 million worth of business to which, all things being equal, smaller business shall have the first claim. In the near future there will be more, since the Veterans Administration has just made a similar arrangement with SDPA. An SDPA procurement specialist will sit with the Veterans Administration procurement people and will help in joint determinations.

Get Chance to Match Low Bids

The Veterans Administration has agreed that if a large business concern is found to be the low bidder, the next lowest small business bidder will be given an opportunity to match the low bid, and if the responsible small business concern matches the low bid, the contract will be awarded to the small concern. Responsibility, which also is defined as competency, is the rock on

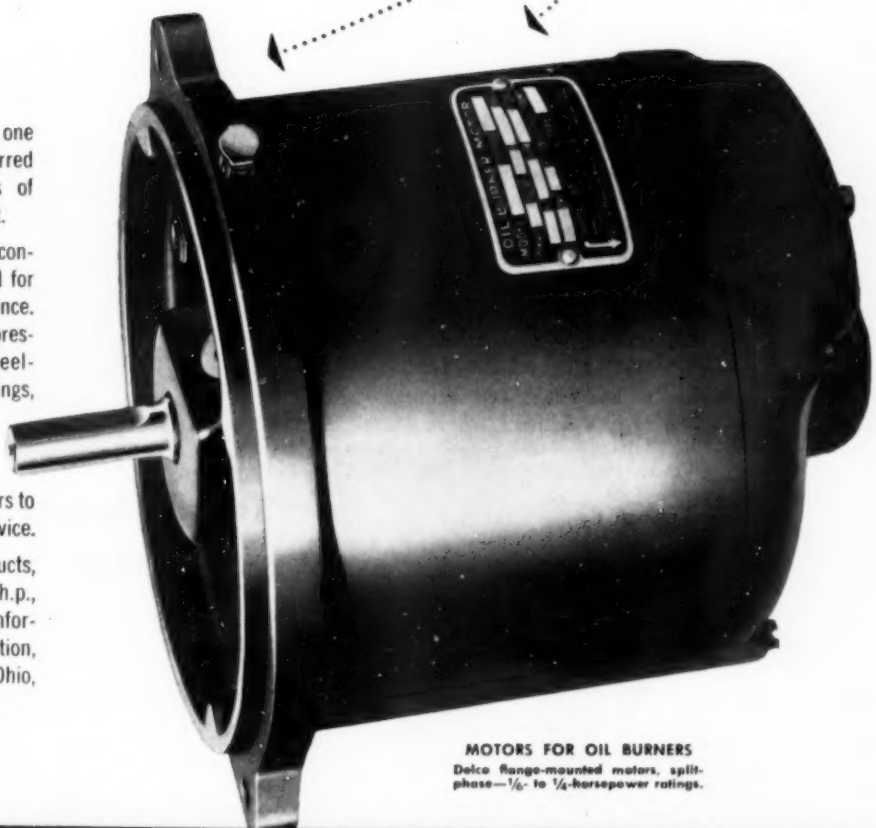
Engineered for DEPENDABILITY

Delco Motors

Careful dynamic balance is only one reason why Delco motors are preferred by many leading manufacturers of heating and ventilating equipment.

An impressive list of features contributes to Delco's enviable record for continuous, trouble-free performance. These features include uniflow pressure-cast rotor conductors, steel-backed tin babbitt sleeve bearings, cored oil wells, varnish-dipped and baked motor windings. Careful selection of materials, too, is a big factor in enabling Delco motors to give longer, more dependable service.

The motors you need for your products, in sizes from fractional to 100 h.p., are in the great Delco line. For information on motors for any application, address Delco Products, Dayton, Ohio, or our nearest sales office.



MOTORS FOR OIL BURNERS
Delco flange-mounted motors, split-phase—1/6- to 1/4-horsepower ratings.

THE BEST RUNNING MATE YOUR PRODUCT CAN HAVE

MOTORS FOR BLOWERS
Delco resilient-mounted motors, split-phase and capacitor-start types, single- and two-speed designs—1/6- to 3/4-horsepower ratings.

DELCO PRODUCTS
Division of General Motors Corporation • Dayton, Ohio

SALES OFFICES:
ATLANTA • CHICAGO • CINCINNATI • CLEVELAND • DALLAS
DETROIT • HARTFORD • PHILADELPHIA • ST. LOUIS • SAN FRANCISCO

which SDPA often finds the smaller bidder comes to grief in the defense agencies. It has finally, therefore, made this arrangement. It thoroughly investigates the bidder, and upon finding the bidder responsible and competent, SDPA gives to the defense agency a certificate of competency which it has been ruled shall govern. When a smaller industrialist's bid is as low as that of the big corporation, the SDPA's certificate of competency determines who gets the business.

Give Counsel on Sub-Contracts

Probably one of the most important services that Mr. Farthing and his associates render to the smaller business man is that they will guide and counsel him in regard to sub-contracts and sub-sub-contracts. Usually those who go after the various strata of sub-contracts keep in touch with the situation by placing their names on the bidders' lists, and following the course of events involving a contract that appears to have potentialities for them. Mr. Farthing and his associates of the SDPA will help those who apply to them, and it is probable that their service may spell the difference between success and failure in going after the sub-contracts. Bear in mind, however, that in no sense are Mr. Farthing and his associates business agents for any particular person. It is their job to give counsel and help where it is legitimate for government to do so. Incidentally, General Services Administration has established uniform standards for determining the propriety of relationships between sales agents and their clients who sell to the government. GSA says the standards are aimed at slamming the door on the influence peddler and the seeker of exorbitant fees. If you are interested in the details of the standards, ask General Services Administration, Office of Public Information and Reports, Washington 25, D. C., for General Regulation 12.

Where to Write to be Listed as Bidder

If you wish to register to be listed as a bidder, write, as outlined earlier, to the following:

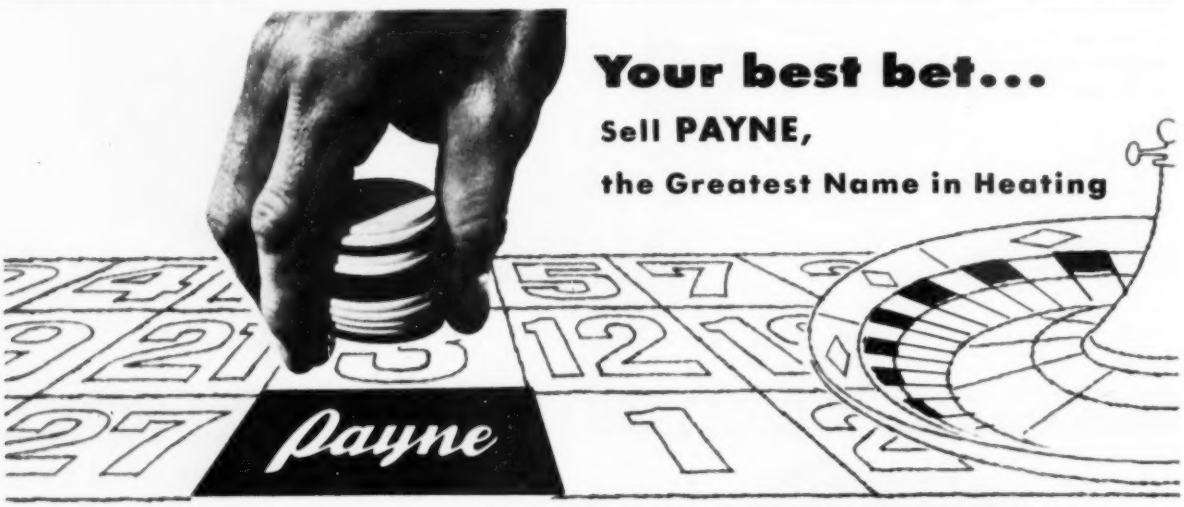
Federal Security Agency, National Institute of Health, Public Health Service, Bethesda, Maryland; U. S. Weather Bureau, Attention, Chief, Procurement and Supply Section, Washington 25, D. C.; Veterans Administration, Procurement Division, Supply Service, Washington 25, D. C.; National Bureau of Standards, Procurement Section, Connecticut Avenue and VanNess Street, Washington 25, D. C.; U. S. Atomic Energy Commission, at Oak Ridge, Tenn., and Sandia Base, Albuquerque, N. M., or Idaho Falls, Idaho.

The U. S. Treasury Dept. has procurement offices as follows: Contracting Officer, U. S. Coast Guard Headquarters, Washington 25, D. C.; Materials Management Officer, Bureau of Engraving and Printing, 14th and C Sts., S. W., Washington 25, D. C.; Contracting Officer, U. S. Coast Guard Supply Center, 345 Warren St., Jersey City 2, N. J.; Commander, First Coast Guard District, 1400 Custom House, Boston 9.

The U. S. Dept. of Justice procures at: Natural Bridge Camp, Greenlee, Va.; and Federal Prison Industries, Federal Reformatory, Chillicothe, Ohio.

The U. S. Dept. of the Interior procures at Southwestern Power Commission, P. O. Drawer 1619, Tulsa.

(Continued on page 44)



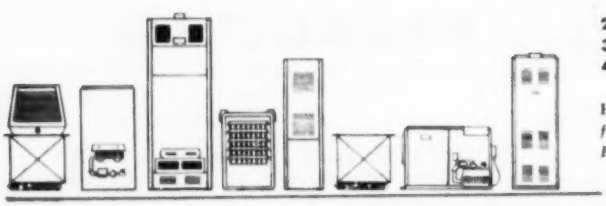
Your best bet...

Sell PAYNE,

the Greatest Name in Heating

Only the PAYNE line gives you all these money-making features:

1. Priced right to sell — in tracts, projects, or mansions.
2. Complete new furnace line.
3. Highest profit.
4. Guaranteed quality.
5. Built for easiest installation.
6. Designed for easiest service.
7. Outstanding advertising and sales promotion to back up your selling efforts.



PAYNE *offers a complete new 1953 line of gravity and forced air designs for closet, attic, floor, wall, basement or crawl space installation. For descriptive literature—for the name of your local distributor—write*

Payne FURNACE
MONROVIA, CALIFORNIA

A Division of Affiliated Gas Equipment, Inc., Monrovia, Calif.; Cleveland, Ohio; Tyler, Texas; Indianapolis, Indiana

SOME ANSWERS TO YOUR SHOP QUESTIONS ON

deep drawing

STRAIGHT-CHROMIUM STAINLESS STEELS

Single draw forms this sink from Type 430 Stainless Steel

This kitchen sink fabricated by a prominent manufacturer, is a striking example of the deep drawing properties of U·S·S 17 (Type 430) Stainless Steel.

It was formed from a 30" x 32" blank of 20-gage Type 430 Stainless Steel *in a single draw* without post-annealing.

This sink was formerly fabricated from a grade of nickel-bearing Stainless Steel. But restriction on the use of this grade turned attention to readily-available straight-chromium Stainless. It was found that this product could be fabricated from U·S·S 17 Stainless without changing the design.

This is another in a series of advertisements discussing the straight-chromium grades of Stainless Steel from the standpoint of fabricating performance. Other operations that will be considered in future discussions are machining, cutting, spinning, welding and finishing.

DEEP drawing of such straight-chromium grades of Stainless Steel as U·S·S 17 (Type 430) is being carried out successfully by a growing list of fabricators. Their experience indicates you need expect no difficulty if a few simple principles are kept in mind.

Straight-chromium grades have a lower ductility and a higher yield strength than the nickel-bearing grades. In fact, their drawing characteristics are more like that of carbon steel.

As a result, die clearances and hold-down pressures should favor feeding in of the metal rather than stretching. Stock to be worked should be at least room temperature and it may be helpful to warm the blanks in boiling water. Well-lubricated dies should be used at all times.

In the first draw, reduction should be held to 20 to 25% with 35% as the maximum in special cases. Subsequent draws should not exceed 15%. Annealing between draws may or may not be necessary.

In connection with annealing, it should be remembered straight-chromium grades anneal at much lower temperatures than nickel-bearing grades of Stainless Steel. Consequently, there will be only slight scaling and no difficulty in removing it.

In every case, it will pay you to consult with our representatives concerning straight-chromium Stainless Steels. They will examine the job from the standpoints of end use and shop equipment and give you their recommendations.

UNITED STATES STEEL CORPORATION, PITTSBURGH • AMERICAN STEEL & WIRE DIVISION, CLEVELAND • COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO
NATIONAL TUBE DIVISION, PITTSBURGH • TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA. • UNITED STATES STEEL SUPPLY DIVISION, WAREHOUSE DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

U·S·S STAINLESS STEEL

SHEETS · STRIP · PLATES · BARS · BILLETS · PIPE · TUBES · WIRE · SPECIAL SECTIONS

3-494

UNITED STATES STEEL

Yours for the asking

. . . this new, authoritative handbook — based on the latest research in gas appliance venting

When you install gas burning appliances, you'll want this useful handbook containing complete, up-to-date information on gas venting practices plus many helpful installation tips. The findings presented are based on extensive engineering research recently completed by the Metalbestos Division, William Wallace Company, with the assistance of Stanford Research Institute.

Here are some of the subjects covered:

- *Fundamental Rules of Venting*
- *Determining Correct Vent Sizes and Capacities*
- *Choosing the Location of Vertical Vents*
- *Rules for Venting Various Types of Appliances*
- *Vent Installation Tips*

Amply illustrated throughout — and indexed for convenient reference — this handy pocket-size booklet will be an invaluable aid to anyone who specifies, sells, installs or services gas burning installations.

Send for your free copy today! No obligation.

METALBESTOS DIVISION
WILLIAM WALLACE COMPANY · BELMONT, CALIF.

DEPT. B

Please send me without cost, _____ copies of VENT INSTALLATION HANDBOOK.

NAME _____ TITLE _____

COMPANY _____

ADDRESS _____

CITY _____ ZONE _____ STATE _____

The U. S. Department of Agriculture procures from: Chief, Procurement and Supply, Forest Service, Washington 25, D. C.; Administrative Service Division, Soil Conservation Service, Washington 25, D. C.; Production and Marketing Administration, Chief, Procurement and Property Management Division, Office of Administrative Services, Rm. 5716 South Bldg., Washington 25, D. C.; and Bureau of Animal Industry, Washington 25, D. C.

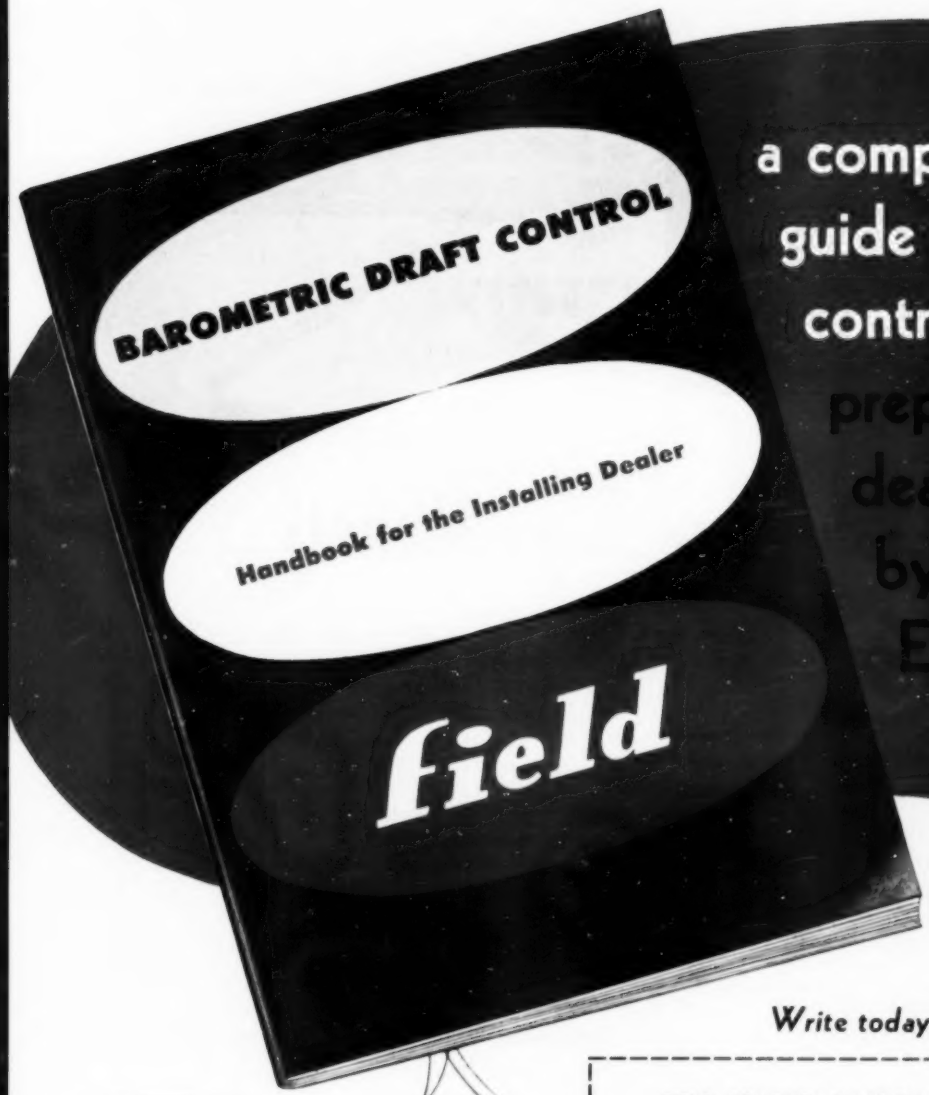
The National Advisory Committee for Aeronautics Procurement offices are at: Langley Field, Va.; Lewis Flight Propulsion Laboratory, 2100 Brookpark Rd., Cleveland; and Ames Aeronautical Laboratory, Moffett Field, Calif.

The U. S. Dept. of Commerce procures at: Civil Aeronautics Administration, Alaska Supply Branch, 2400 Fourth Ave., South, Seattle 4; Division of Purchase and Sales, Maritime Administration, Washington, D. C., or 45 Broadway, New York 6; Civil Aeronautics Administration, Supplies and Services Section, P. O. Box 1082, Oklahoma City; Division Engineer, Bureau of Public Roads, 1440 Columbia Pike, Arlington, Va., or Box 3900, Portland, Ore.; Chief, Procurement Branch, Civil Aeronautics Administration, Rm. 518A, 185 N. Wabash Ave., Chicago 1, Old Haslet Road, P. O. Box 1689, Ft. Worth 1, Washington 25, D.C., 1200 Exchange Bldg., Seattle, and 5651 W. Manchester Ave., Los Angeles 45.

Armed Forces Purchasing Offices

Principal purchasing offices of the Army, Navy, Air Force and Marine Corps are: Procurement of Supply Division, Office, Secretary of the Army, Washington 25, D. C.; Chief, Army and Air Force Exchange Service, 25 W. 43rd St., New York 18; Chief, Chicago Procurement Office, Corps of Engineers, 226 W. Jackson Blvd., Chicago 6; Commanding Officer, Transportation Corps Central Procurement Agency, Marietta Transportation Corps Depot, Marietta, Pa.; Commanding Officer, Oakland Quartermaster Procurement Agency, 124 Grand Ave., Oakland 12, Calif.; Commanding General, New York Quartermaster Purchasing Office, 111 E. 16th St., New York 3, Quartermaster Supply Officer, Columbus General Depot, Columbus 15, Ohio; Commanding General, Philadelphia Quartermaster Depot, 2800 S. 20th St., Philadelphia 45; Commanding General, Chicago Quartermaster Depot, Purchase Div., 1819 W. Pershing Rd., Chicago 9; Commanding Officer, Chemical Corps Procurement Agency, Army Chemical Center, Edgewood, Md.; Commanding General, Ordnance Tank Automotive Center, 1501 Beard St., Detroit; Commanding Officer, Ordnance Small Arms Ammunition Center, 4300 Goodfellow Blvd., St. Louis 20; Commanding Officer, Signal Corps Supply Agency, 225 S. 18th St., Philadelphia 45; Chief, Bureau of Aeronautics, Dept. of the Navy, Washington 25, D. C.; Chief, Bureau of Ordnance, Dept. of the Navy, Washington 25, D. C.; Chief, Bureau of Ships, Dept. of the Navy, Washington 25, D. C.; Chief, Bureau of Yards and Docks, Dept. of the Navy, Washington 25, D. C.; Officer in Charge, Navy Purchasing Office, Dept. of the Navy, Washington 25, D. C.; Commanding Officer, U. S. Submarine Base, New London, Conn.; Commanding Officer, U. S. Naval Supply Depot, Naval Base, Newport, R. I.; Submarine Supply Office, Rittenhouse Square Bldg., 19th and Walnut Sts., Philadelphia 3; Aviation Supply Officer, Aviation Supply Office, 700 Robbins Ave., Philadelphia 11; General Store Supply Officer, General Store Supply, 700 Robbins Ave., Philadelphia 11; Supply Officer, U. S. Naval Gun Factory, Washington 25, D. C.; Commanding Officer, U. S. Naval Supply Depot, Mechanicburg, Pa.; Officer in Charge, Navy Purchasing Office, U. S. Naval Supply Center, Norfolk 11, Va.; Supply Officer, U. S. Naval Air Station, Jacksonville, Fla., Pensacola, Fla., or Corpus Christi, Tex.; Yards and Docks Supply Officer, U. S. Naval Construction BN Center, Port Hueneme, Calif.; The Headquartees Exchange Officer, Headquarters U. S. Marine Corps, Washington 25, D. C.; Headquarters, U. S. Marine Corps, The Quartermaster General, Washington 25, D. C.; Procurement Division, Air Materiel Command, Wright-Patterson Air Force Base, Dayton, Ohio.

For Air Force procurement write Regional Air Procurement Office at Cincinnati, Cleveland, Dayton, Detroit, Newark, N. J., New York, Chicago, Indianapolis, Milwaukee, Minneapolis, South Bend, Clayton, Mo., Boston, Rochester, N. Y., Atlanta, Dallas, Wichita, Glendale, Los Angeles, San Diego, Oakland, and Seattle.



a complete new guide to draft control installation

prepared as a dealer service by Field Control Engineers

Write today for your copy—it's FREE!

this is NOT an advertising piece

It's your new pocket sized primer on draft controls. 20 fact-packed pages tell *where* to install a draft control, *why*, *how*, *what size*. Simply, clearly written and illustrated for on the job use by today's leading authorities on draft controls.

FIELD CONTROL DIVISION
Mendota, Illinois

Please send me a complimentary copy of your new service booklet, "Barometric Draft Controls—Handbook for the Installing Dealer"

MY NAME _____

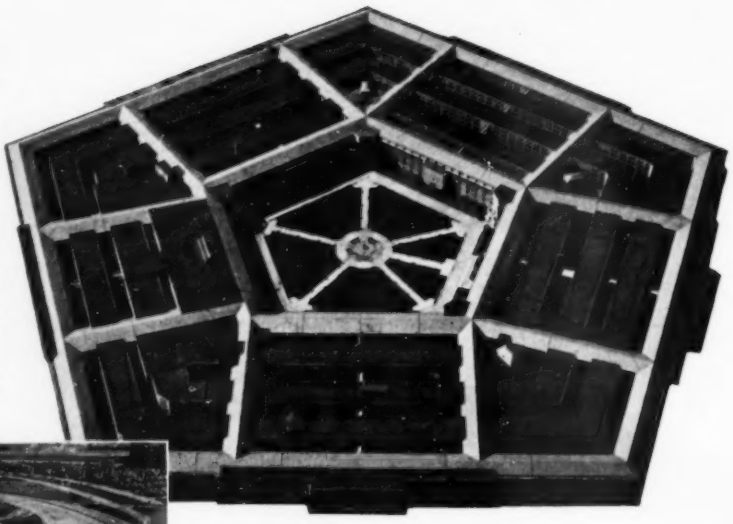
MY FIRM _____

STREET _____

CITY _____ STATE _____

FOR PROTECTION, old gutters on Washington's Pentagon Building were replaced in 1949 with gutters of Monel Roofing Sheet. Although sheet only .025 in. thick was used, the gutters are safe from damage by heat, cold, rain, snow, ice and airborne corrosives.

A RIVETED AND SOLDERED section of Monel Roofing Sheet is installed in the built-in gutter of the Pentagon's outer perimeter. Contractor, Rupertus Sheet Metal Works, Washington, D. C., reports: "Some of the gutters were 55 inches in girth, but Monel was easy to fabricate and install."



A roofing sheet for the jobs ahead

it's light and easy to handle . . . it's Monel!

Extra-large gutters drain heavy rainfall from the tremendous roof areas of Washington's famous Pentagon Building.

Think of putting these big gutter sections all around the outer edges of the Pentagon. And then around the inside court. You *could* run into a lot of fabricating and installation problems.

But the RUPERTUS SHEET METAL WORKS, of Washington, did the entire job without trouble. They report "while some of the gutters were 55 inches in girth, Monel® was still easy to fabricate and install."

Now you may have heard that Monel Roofing Sheet is strong and tough.

That's true. *But Monel has a special roofing temper.* This makes it easy to work with, to cut, bend and form. With Monel, you don't have to worry about cracking, even when you make sharp bends. For a neat soldering job, you pre-tin the sheets in the shop. Then, when you make the actual installation, a heavy, hot iron assures a tight, perfect seam.

With Monel overhead, your customers get a roof that's trouble-free. Salt air, smoke and chemical fumes can't hurt it. High winds can't pry it loose, and heavy loads of snow and ice can't make it sag. That's the kind of roof you can be proud to say you installed!

Right now, with nickel alloys vitally needed for defense, the use of Monel for building purposes is not permitted. In time, though, Monel will be back. Learn how easily you can handle it by sending for your free copy of the helpful bulletin especially prepared for roofing contractors — *Instructions for the Soft Soldering of Monel Roofing Sheet.* There's no telling how soon it may come in handy.

THE INTERNATIONAL NICKEL COMPANY, INC.
67 Wall Street, New York 5, N. Y.

Inco Nickel Alloys

INCO TRADE MARK

Monel . . . *"for the life of the building"*

Mr. Furnace Manufacturer:

...NOW

YOU CAN SELL YEAR-AROUND COMFORT

When designing your furnace to include summer cooling for a true year-around air conditioning system, consider the advantages of a completely sealed Tecumseh hermetic compressor. The 3 H.P. Tecumseh hermetically-sealed compressor is designed primarily for use in year-around systems. This compressor will help your engineers to design the most dependable and efficient year-around air conditioning unit at the lowest possible price.

Yes, these new Tecumseh hermetics are the only compressors in the refrigeration industry today that offer so much for so little. Over 14 million Tecumseh hermetics now in the field attest to the acceptance of the Tecumseh hermetic. That is why furnace manufacturers are specifying Tecumseh in their new cooling units. And that is why it will more than pay you to investigate Tecumseh right now by writing us for complete details.

Remember, you can't go wrong when you specify the best—Tecumseh.

TECUMSEH

TECUMSEH PRODUCTS Company

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HOW TO MAKE MORE

SELLING PALMER

Guaranteed by Good Housekeeping

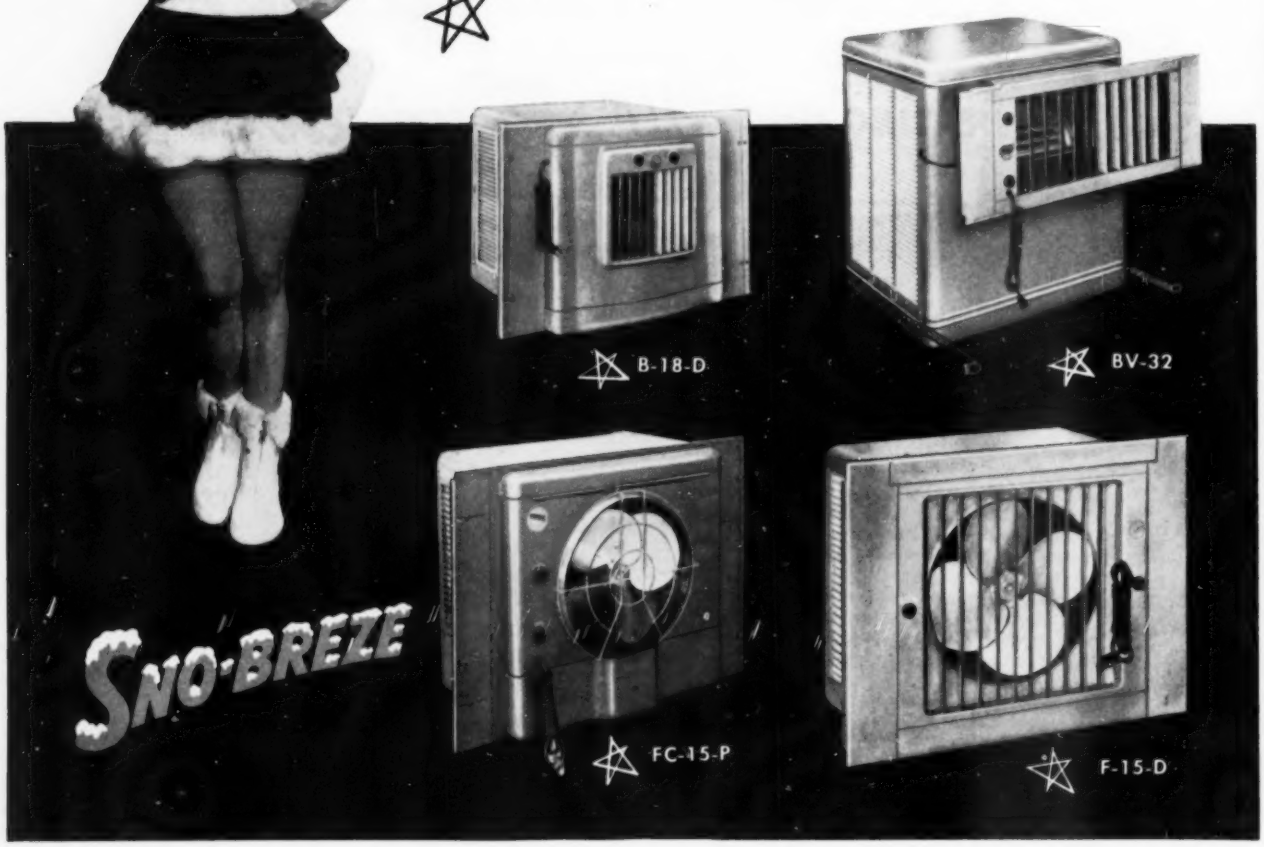
Home owners are no longer willing to endure scorching hot days—unbearable restless nights when heat makes sleep impossible.

Thousands have sought relief by installing air conditioning equipment, but millions of home owners either cannot afford such equipment or are unwilling to pay the costs involved.

The answer is simple—

SELL THEM INEXPENSIVE, EFFICIENT, LOW COST PALMER COOLERS

By actively promoting Palmer Coolers, you are opening up a virtually untapped market—one that can mean big vol-



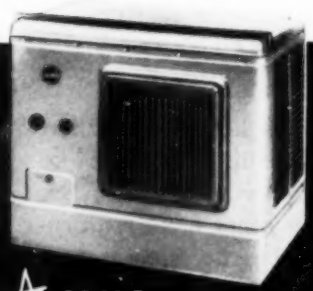
Money...

COOLERS

ume—big profits for you. Either the Sno-Breze or Palmaire line of coolers covers your complete market. These lines include compact coolers for a single room—larger coolers for office, store or home—giant coolers for industrial plant or theater.

These coolers are manufactured by the Palmer Manufacturing Corporation—pioneer in evaporative coolers and America's largest manufacturer. They carry the Good Housekeeping Seal of Approval.

Palmer coolers are backed by a complete advertising and merchandising program. Let this line of modern coolers make money for you. Mail the coupon.



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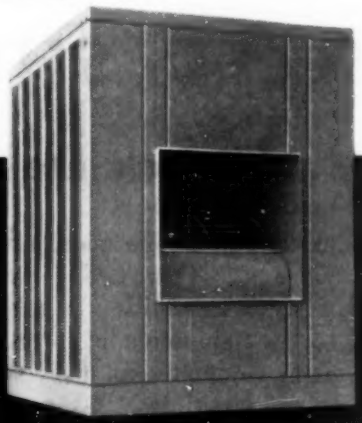

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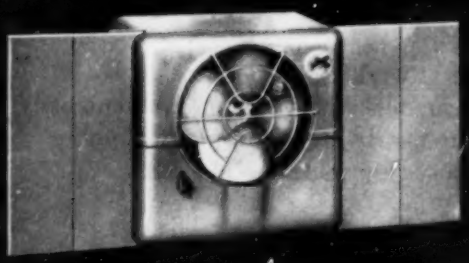


FC-10-P

PALMAIRE

Palmer Manufacturing Corporation
2200 W. Filmore Street
Phoenix, Arizona

Please send me information on Palmer Coolers. I am interested in ☐ **A Distributorship** ☐ **A Dealership**

Name .....

Company .....

Address .....

City ..... *Zone* .... *State* .....

GALVANIZED SHEETS

Top Quality... Quick Delivery

When sheet metal jobs call for galvanized, you want quick delivery. And you want a sheet that forms readily . . . gives long-lasting protection against corrosion.

That's what you get when you call Ryerson, dependable quality, fast service.

Our stocks of galvanized sheets have been improving for the past several months; so we can now offer you many gauges in a wide range of pattern sizes, as well as in sizes cut to your order. These sheets have a uniform coating, clean and bright, which will give your jobs permanence plus a pleasing appearance that your customers will appreciate. And one good job always leads to another.

There's convenience in calling Ryerson, too. In addition to galvanized, you can get quick shipment of most every other steel requirement—hot and cold rolled carbon steel sheets, stainless, Ry-ex expanded metal, bar size angles, etc. Just call your nearest Ryerson plant for fast action.

• • •

Need metal-working machinery or tools? Again you can deal with the same convenient source. Your nearby Ryerson plant supplies every type used by sheet metal shops.

RYERSON STEEL

JOSEPH T. RYERSON & SON, INC. PLANTS AT: NEW YORK • BOSTON • PHILADELPHIA • CINCINNATI • CLEVELAND • DETROIT
PITTSBURGH • BUFFALO • CHICAGO • MILWAUKEE • ST. LOUIS • LOS ANGELES • SAN FRANCISCO • SPOKANE • SEATTLE

AMERICAN ARTISAN — editorial

Another Step Forward

RECENTLY WE TALKED at a state convention with a group of five contractors whose total business careers equaled 235 years. The oldest of the group had been in the warm air heating and sheet metal contracting field for 57 years. Listening to these men recall the industry when they first went to work in it made one realize that the sheet metal field is entering upon another phase of its development — one that is a "natural" to round out the industry's services to the home owner. We mean summer cooling.

They pointed out that back in the 90's the sheet metal shop was a place people came to when they wanted gutters installed or some gadget made, or occasionally wanted a metal roof put on or a duct system installed to provide ventilation in an industrial plant. Then when the first central plant gravity warm air heating systems were installed, the sheet metal trade was called upon to handle this new heating medium. There was no one else capable of making and installing the ductwork that would carry the heat to the rooms. In those days, determining duct sizes and fittings was a hit or miss affair, but it wasn't long before this situation was corrected and standards were established to assure adequate heating to all rooms, regardless of their sizes, shapes or exposures.

As duct sizing methods developed, the firing of furnaces changed from manual to automatic, and forced warm air heating systems were developed and perfected. The sheet metal contractor now found he had to be an authority on warm air heating and heating problems. His development came about gradually, as he learned to find the answers to the many problems involved. Each problem solved was a step in the right direction.

Now another important means for providing year 'round comfort has come into constantly increasing use — summer cooling. Much is already known about the mechanics of this comfort medium from experiences gained with large buildings and early residential systems, and warm air heating dealers all over the country are daily accumulating knowledge of and experience with summer cooling.

Home owners with complete air conditioning report many advantages other than just comfort. They say the cost of decorating is considerably reduced because windows are kept closed throughout the year, and noises from the street are eliminated for the same reason. Those who have suffered from hay fever and other discomforts due to airborne pollen wouldn't be without air conditioning in their homes.

The American Artisan remembers well when automatic heating and forced warm air began their rapid climb to acceptance by the public. We feel from the signs now evident that summer cooling is following the same pattern and is on its way as another important phase of the warm air heating field.

. . . for old homes

. . . for new homes

RESIDENTIAL COOLING

Equipment Available This Year

(COMPLETE PACKAGED CENTRAL UNITS)

EVERY INDICATION seems to point to 1953 as the year of the greatest demand for — and sales and installation of — residential cooling that has been known to date. Some estimates indicate that over 50,000 central warm air heating systems will have cooling equipment installed this year. Of this number, it is thought that approximately 30,000 packaged central systems will be in the 1,000,000 new homes expected to be built this year, with the remaining 20,000 added to existing systems.

Estimates Indicate Great Activity

Market research analysts have said that the growing demand to provide cooling for residences indicates that next year may see approximately 75,000 new or existing homes with central cooling equipment. They figure 110,000 installations for 1955, and for 1956, a total of 150,000.

The figures quoted are, of course, estimates and therefore not necessarily ultimately correct. They are averages taken from a number of sources. One such source believes the total installations of packaged central systems for residential application will be 40,000 in 1953, whereas another believes that 60,000 central systems would be nearer the actual number for this year.

The actual number of installations made this year may be above or below the approximate figure of 50,000. But whatever the number is at the end of the year, it seems apparent it's going to be considerably more than in any previous year.

"Artisan" Surveys Equipment Displayed

This survey by the American Artisan of residential cooling equipment displayed at the 11th International Heating, Ventilating and Air Conditioning Exposition held in Chicago earlier this year revealed that a major "theme" of the entire show was residential air conditioning — summer cooling. The majority of furnace manufacturers either had on display a cooling "package" that had been designed to go as a companion piece with their heating equipment, or indicated that cooling equipment for this purpose is being planned.

Only complete packaged cooling units in the 1½ to 6 ton range of refrigeration capacity and containing all essential components necessary to furnish cooling to a warm air heating system are evaluated in this particular survey. Components of such "packages" are not covered this month. Window units and room units are not included.

The study revealed that 20 furnace manufacturers exhibited cooling equipment adaptable for installation with their furnaces; five furnace manufacturers displayed combination heating and cool-

ing package units; four furnace manufacturers recommended use of a particular remote cooling package with their furnaces; and only 24 furnace manufacturers at the show did not display cooling equipment. But 14 of these 24 have such equipment now in the planning stage.

In addition to these displays of furnace manufacturers, 14 refrigeration equipment manufacturers showed cooling packages that can be added to a warm air heating system.

This interest in residential cooling on the part of both the furnace and cooling equipment manufacturers further indicates the great residential air conditioning activity that can be expected.

Is It Really a "Trend"?

The evident increase in the demand for residential cooling equipment makes one wonder, of course, if this actually represents a "trend" or if it is a passing fancy. If it is a trend, why didn't it start long ago?

One answer may be a new attitude on the part of many home builders. According to reports, many builders realized that something new had to be found that would appeal to the prospective home owner — something that would make living more enjoyable and be worth the investment. Complete air conditioning — offering comfort, cleanliness and better health — seemed to be the answer.

Another point that indicates the present interest in residential cooling as a continuing trend is the ever-increasing use of air conditioning in business and industry. People who work in air conditioned offices, eat in air conditioned restaurants, shop in air conditioned stores and ride in air conditioned trains — or automobiles — are not content to go home at night to live in hot and humid surroundings. They want to do something about it — and they can.

A third point to consider is the reduction that has come in installation costs. A few years ago, an air conditioning system for a residence was considered a bargain if it cost no more than $2500. Today, a price frequently heard is around $1000.

Existing Homes a Big Market

The activity in new home air conditioning has of course been reflected in the number of installations made in older houses with warm air heating systems. There are about 12,000,000 homes heated by warm air systems, and a great number of them are prospects for modernization with cooling. There are other millions of homes where other types of heating equipment are used. Many of these homes represent a potential market not only for summer cooling but for replacement of the existing heating plant with a warm air system.

The resale value of an old building takes on more importance as more and more homes follow the trend toward complete air conditioning. At a recent convention of home builders it was stated that within five years homes without air conditioning will be extremely difficult to sell.

Requires Knowledge of Air Distribution

The large number of central residential air conditioning systems that will be installed in this and the coming years will require — perhaps most importantly — a thorough understanding of air distribution.

Because warm air heating dealers know air distribution and air diffusion, know how to fabricate and install ductwork, how to locate air diffusers and supply registers, where to install the return grilles so that proper air distribution can be obtained when the completed system is balanced, and the numerous other practical considerations in putting air where it's needed — because the warm air heating dealers know these things so well through years of experience, the great majority of residential cooling installations will be made by them.

It is obvious, too, that a warm air heating system is about the only feasible installation with which summer cooling for a residence can be incorporated.

"Round-Up" of Information

The American Artisan — which serves exclusively the warm air heating and residential air conditioning dealer, and the sheet metal contractor — therefore presents here a "round-up" of information on some of the cooling equipment now available to the warm air heating dealer so that he may review his sales program and select the equipment that will answer the needs of his customers.

The fundamentals of air conditioning, installation procedures and how-to-do-it articles on residential applications have long been presented in American Artisan's pages. Articles along these lines will continue in the months to come.

The following specifications and comments about equipment have been compiled from material furnished by each manufacturer at the direct request of American Artisan. This presentation is designed to give the essential features and capacities of the equipment in easy-to-read form. Other equipment of the same type — and data on other types of residential cooling equipment and component parts — will be presented in other survey articles.

Central Cooling Equipment

Airtemp

Two ton unit: 24,960 Btu per hr; 800 cfm air circulation.

Three ton unit: 38,520 Btu per hr; 1200 cfm air circulation.

Five ton unit: 64,200 Btu per hr; 2000 cfm air circulation.

All units: Water consumption 1.5 gal per ton, 75 F inlet, 95 F outlet; single or 3 phase, 230 volt motor; ½ in. glassboard insulation; cabinet 16 gage sheet metal; semi-hermetic compressor, 4 or 5 cylinders; refrigerants "Freon-12" and "Freon-22".

Installation features: Self-contained; factory wired and tested; ready for use after connection of condenser cooling water line, drain line and electrical supply.

Servicing features: Ample work space inside cabinet; all control and gage valve connections located in front of unit for accessibility.

Manufacturer: Airtemp Div., Chrysler Corp., 1600 Webster St., Dayton 1, Ohio

American-Standard

Two ton unit: 25,700 Btu per hr; 840 cfm air circulation.

Three ton unit: 38,550 Btu per hr; 1260 cfm air circulation.

Both units: Water consumption 1.5 gal per ton, 75 F inlet, 95 F outlet; single phase, 230 volt motor; ½ in. fiber glass insulation; cabinet 18 and 20 gage sheet metal; throwaway filters; 3 cylinder full hermetic compressor; refrigerant "Freon-22".

Installation features: Separate circuits are fully assembled, hermetically sealed at factory; jacket has rigid slip-joint construction.

Servicing features: Separate refrigerant circuits can be removed singly without disturbing rest of installation; separate circuit connections easy to handle; unit operates even with one circuit removed for service; circuits serviced easily and separately, either in or out of unit.

Manufacturer: American Radiator & Standard Sanitary Corp., P. O. Box 1226, Pittsburgh 30, Pa.

Armstrong Furnace

Two ton unit: 400 cfm air circulation per ton, or 800 cfm.

Three ton unit: 400 cfm air circulation per ton, or 1200 cfm.

Both units: 220 volt, single phase motor; cabinet 22 gage sheet metal; 1 in. glass wool insulation; filter frames provided for throwaway filters; 2 cylinder full hermetic compressor; refrigerant "Freon-12"; both units furnished either with or without blower.

Installation features: Entire refrigeration unit — compressor, cooling coil, condenser, motor, tubing and valves — is welded and brazed into a single hermetically sealed unit at the factory; installer connects air ducts, electric and water lines to complete installations.

Servicing features: Unit is guaranteed for five years; in case of failure, water and electric lines are disconnected and entire unit slides out of its cabinet and is replaced by another.

Manufacturer: Armstrong Furnace Co., 851 W. Third Ave., Columbus 8, Ohio.

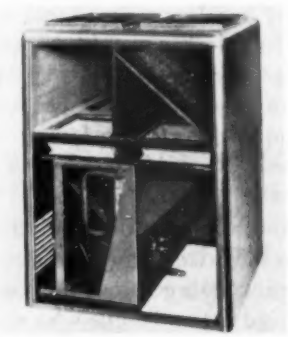
Automatic Firing

Three ton unit: 36,000 Btu per hr; 1500 cfm air circulation; water consumption 4.8 gal per min, 75 F inlet, 95 F outlet; 2 cylinder semi-hermetic compressor; refrigerant charge "Freon-12" 15 lb.

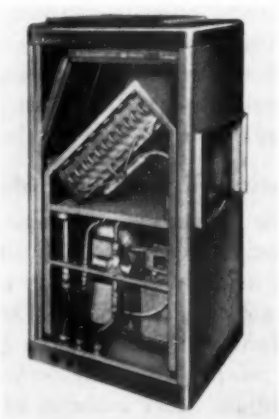
Five ton unit: 60,000 Btu per hr; 2000 cfm air circulation; water consumption 8.0 gal per min, 75 F inlet, 95 F outlet; 4 cylinder semi-hermetic compressor; refrigerant charge "Freon-12" 20 lb.

Both units: Three phase, 220

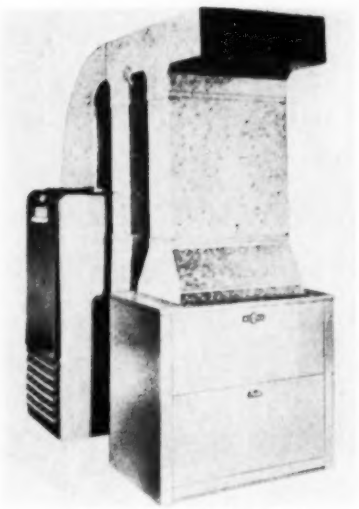
Airtemp Div., Chrysler Corp.



American Radiator & Standard Sanitary Corp.



Armstrong Furnace Co.



A. G. Barkow Mfg. Co., Inc.

volt motor; ¾ in. fiber glass insulation; renewable filters.

Installation features: Shipped complete in three crates; one crate contains the furnace half, another contains the refrigeration half, and the third contains the plenum chamber, two thermostats and the combination fan and limit control for the furnace.

Servicing features: All controls accessible from front of unit; seasonal changeover accomplished by damper lever on side.

Manufacturer: Automatic Firing Corp., 4417 Oleatha Ave., St. Louis 16, Mo.

Brunner Mfg. Co.

Barkow

Two ton unit: 24,000 Btu per hr; 800 cfm air circulation.

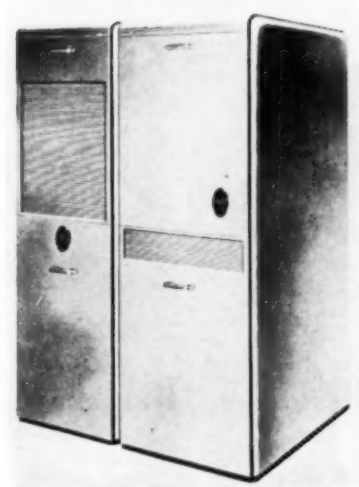
Three ton unit: 36,000 Btu per hr; 1200 cfm air circulation.

Both units: Water consumption 1.5 gal per ton, 75 F inlet, 85 F outlet; single phase, 220 volt motor; 1 in. fiber glass insulation; cabinet 20 gage sheet metal; 2 cylinder full hermetic compressor; refrigerant "Freon-22"; renewable filters.

Installation features: Complete packaged unit shipped assembled; adaptable to supply duct installation; cleanable type water cooled condenser adaptable for cooling tower use.

Servicing features: All parts accessible from front panel; evaporator easily cleaned.

Manufacturer: A. G. Barkow Mfg. Co., Inc., 2230 S. 43rd St., Milwaukee 15, Wis.



Bryant Heater Div., Affiliated Gas Equipment, Inc.

Brunner

Two ton unit: 24,500 Btu per hr; 800 cfm air circulation; refrigerant charge "Freon-12" 7 lb.

Three ton unit: 36,000 Btu per hr; 1200 cfm air circulation; refrigerant charge "Freon-12" 11 lb.

Five ton unit: 61,000 Btu per hr; 2000 cfm air circulation; refrigerant charge "Freon-12" 13 lb.

All units: Water consumption 1.5 gal per min per ton, 75 F inlet, 95 F outlet; single, 2 or 3 phase, 220 volt motor; 2 cylinder open type compressor; permanent type filters.

Installation features: Water connections may be made from either right or left side; reversible plenum chamber; all electrical connections wired at factory.

Servicing features: Designed to permit removal of compressor and motor and access to all valves from front of unit; ample working room.

Manufacturer: Brunner Mfg. Co., 1821 Broad St., Utica, N.Y.

Bryant Heater

Two ton unit: 24,000 Btu per hr; 800 cfm air circulation; water consumption 120 gal per hr, 75 F inlet, 95 F outlet; 2 cylinder full hermetic compressor; refrigerant charge "Freon-22" 5 lb.

Three ton unit: 36,000 Btu per hr; 1200 cfm air circulation; water consumption 180 gal per hr, 75 F inlet, 95 F outlet; 2 cylinder full hermetic compressor; refrigerant charge "Freon-22" 6 lb.

Five ton unit: 60,000 Btu per hr; 2000 cfm air circulation; water consumption 300 gal per hr, 75 F inlet, 95 F outlet; 4 cylinder semi-hermetic compressor; refrigerant charge "Freon-12" 11 lb.

All units: Single or 3 phase, 230 volt motor; throwaway filters; cabinet 20 gage sheet metal.

Installation features: Control panel conveniently located for selection of summer or winter temperature; constant or intermittent air circulation; all wiring complete.

Servicing features: Adequate space for adjustments and mechanical repairs; all parts accessible from front.

Manufacturer: Bryant Heater Div., Affiliated Gas Equipment, Inc., 17825 St. Clair Ave., Cleveland 10, Ohio

Central Cooling Equipment

Carrier

Two ton unit: 24,000 Btu per hr; 800 cfm air circulation. (Both water and air cooled models available.)

Three ton unit: 36,000 Btu per hr; 1200 cfm air circulation.

Five ton unit: 60,000 Btu per hr; 2000 cfm air circulation.

All units: Water consumption 1.5 gal per ton, 75 F inlet, 95 F outlet; single or 3 phase, 220 volt motor; throwaway filters; 1 in. fiber glass insulation; cabinet, large panels 18-20 gage sheet metal, base and supporting members 12-16 gage sheet metal; semi-hermetic compressor 2-4 cylinders; refrigerants "Freon 12" or "Freon-22".

Installation features: Occupies minimum space; discharge air may be directed in any one of four directions; return air may enter bottom, side or back of unit; all units designed to pass through 30 in. door.

Servicing features: All components easily accessible from the front; burner assembly removable in one piece; compressor of accessible hermetic type.

Manufacturer: Carrier Corp., 300 S. Geddes St., Syracuse 1, N.Y.

Coleman

Two ton unit: 24,000 Btu per hr; 800 cfm air circulation; water consumption 200 gal per hr.

Three ton unit: 36,000 Btu per hr; 1200 cfm air circulation; water consumption 300 gal per hr.

Both units: Adaptable to special evaporative condenser package using about 3 gal water per hr per ton; throwaway filters; open type compressor; single or 3 phase, 110-220 volt motor; ½ in. cabinet insulation.

Installation features: Shipped in two separate packing cases; cooling coil unit fits on top of furnace; condensing unit package located at remote point; low floor area required.

Servicing features: All parts easily accessible for servicing.

Manufacturer: Coleman Co., Inc., St. Francis & Second St., Wichita 1, Kans.

Conco

Two ton model: 24,000 Btu per hr; 800 cfm air circulation; single phase, 220 volt motor; cabinet, 20 gage sheet metal; throwaway filters; full hermetic compressor; refrigerant "Freon-12".

Installation features: One base and damper arrangement for both units.

Servicing features: Package type cooling unit, making it easy to replace assembly.

Manufacturer: Conco Engineering Works Div., H. D. Conkey & Co., Mendota, Ill.

Curtis

Two ton unit: 24,000 Btu per hr; 800 cfm air circulation.

Three ton unit: 38,750 Btu per hr; 1200 cfm air circulation.

Five ton unit: 60,000 Btu per hr; 2000 cfm air circulation.

All units: Single or 3 phase, 230 volt motor; shell and coil water cooled condenser; water consumption 4.8 gal per min at 20 deg rise; throwaway filters; refrigerant "Freon-12".

Installation features: Compact design; supply and return openings adjustable for either side or top connection; completely insulated and wired at factory.

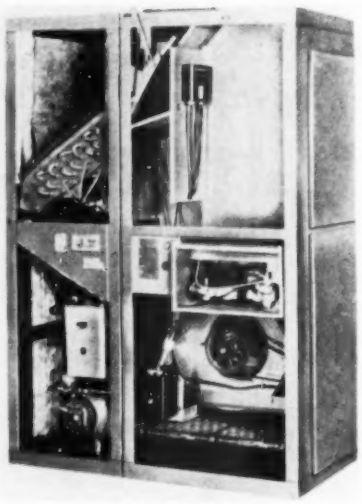
Servicing features: Front access panel; ample room for service procedures.

Manufacturer: Curtis Refrigerating Machine Div., Curtis Mfg. Co., 1905 Kienlen Ave., St. Louis 20, Mo.

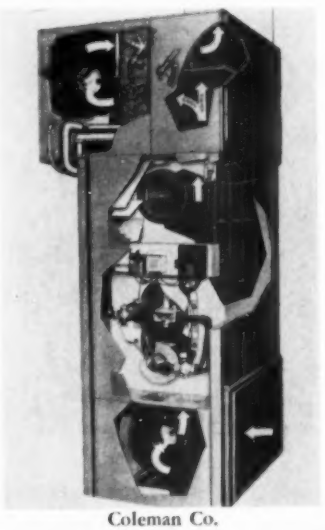
Frigidaire

Three ton unit: 36,000 Btu per hr; 1200 cfm air circulation.

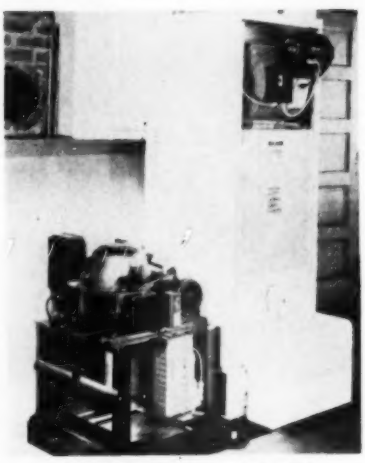
Five ton unit: 54,000 Btu per hr; 2000 cfm air circulation.



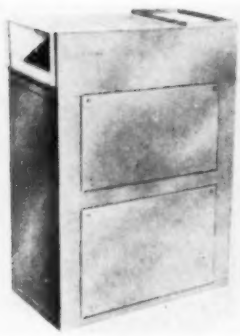
Carrier Corp.



Coleman Co.

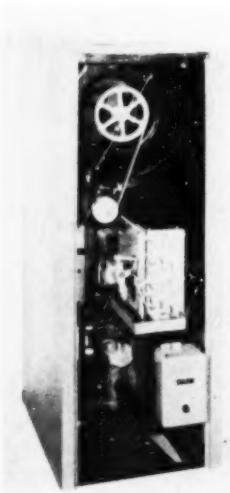


Conco Engineering Works Div.



Curtis Refrigerating Machine Div., Curtis Mfg. Co.

Frigidaire Div., General Motors Corp.



General Electric Co.

Both units: Special insulation; refrigerant "Freon-12"; throwaway filters; semi-hermetic compressor; single or 3 phase, 220 volt motor.

Installation features: Self-contained; factory wired and tested; ready for use after connection of condenser cooling water line, drain line and electrical supply.

Servicing features: Ample work space inside cabinet; front accessibility.

Manufacturer: Frigidaire Div., General Motors Corp., 300 Taylor St., Dayton 1, Ohio

General Electric

Two ton unit: 24,000 Btu per hr; 800 cfm air circulation; water consumption 68 gal per hr; 55 F inlet, 105 F outlet.

Three ton unit: 36,000 Btu per hr; 1200 cfm air circulation; water consumption 102 gal per hr, 55 F inlet, 105 F outlet.

Five ton unit: 60,000 Btu per hr; 2000 cfm air circulation; water consumption 175 gal per hr, 55 F inlet, 105 F outlet.

All units: Single or 3 phase, 230 volt motor; 1 in. glass wool insulation; throwaway filters; full hermetic compressor; refrigerant "Freon-12".

Installation features: Completely factory assembled sealed refrigerant system.

Servicing features: Sealed refrigerant system replaceable as a unit; all service from front.

Manufacturer: General Electric Co., Air Conditioning Div., 5 Lawrence St., Bloomfield, N.J.

Hupp

Two ton unit: 24,000 Btu per hr; 800 cfm air circulation; refrigerant charge "Freon-12" 6 lb.

Three ton unit: 36,000 Btu per hr; 1125 cfm air circulation; refrigerant charge "Freon-12" 9 lb.

Five ton unit: 60,000 Btu per hr; 2000 cfm air circulation; refrigerant "Freon-12".

All units: Water consumption 1.5 gal per ton, 75 F inlet, 95 F outlet; single phase, 230 volt motor; ½ in. fiber glass insulation; cabinet 20 gage sheet metal; throwaway filters; 2 cylinder semi-hermetic compressor.

Installation features: Recircuiting kit for cooling tower operation; central cooling systems can be installed using existing furnace blower or an independent filter and blower kit can be furnished; water and drain connections mounted on common plate and easily accessible; top or side inlet air connections and top outlet air connections.

Servicing features: Easy to remove panels covering all four sides enabling maximum accessibility to all parts for service; the air side of the central cooling system can be operated while checking the condensing unit in the machine compartment; use of serviceable hermetic compressor and pump down type system incorporating large refrigerant storage capacity.

Manufacturer: Hupp Corp., 1250 W. 76th St., Cleveland, Ohio

Iron Fireman

Two ton unit: 24,000 Btu per hr; 840 cfm air circulation.

Three ton unit: 36,000 Btu per hr; 1260 cfm air circulation.

Five ton unit: 60,000 Btu per hr; 2160 cfm air circulation.

All units: Water consumption 1.5 gal per ton, 75 F inlet, 95 F outlet; single phase, 220 volt motor; throwaway filters; ½ in. fiber glass insulation; cabinet 20 gage sheet metal; 2 cylinder semi-hermetic compressor; refrigerant "Freon-12".

Installation features: Completely assembled package.

Servicing features: Cleanable condenser; all panels easily removable; any component can be serviced on job without removing entire unit.

Manufacturer: Iron Fireman Mfg.

Co., 3121 W. 106th St., Cleveland 11, Ohio

Lennox

Three ton unit: 36,000 Btu per hr; 1500 cfm air circulation.

Four and one-half ton unit: 54,000 Btu per hr; 1800 cfm air circulation.

Six ton unit: 72,000 Btu per hr; 2400 cfm air circulation.

All units: Single phase, 230 volt motor; throwaway filters; ½ in. fiber glass insulation; cabinet 20 gage sheet metal; two 2-cylinder compressors, full hermetic; refrigerants 2.5 lb of "Freon-12" in each 1½ hp compressor, 2.8 lb "Freon-22" in each 3 hp compressor.

Installation features: Two units with step starting to reduce electrical surge; floor, sides, and rear of heating cabinet require no clearance to combustibles.

Servicing features: All service performed from front.

Manufacturer: The Lennox Furnace Co., 200 S. 12th Ave., Marshalltown, Iowa.

Lipman

Two ton unit: 24,000 Btu per hr; 800 cfm air circulation.

Three ton unit: 36,000 Btu per hr; 1200 cfm air circulation.

Five ton unit: 60,000 Btu per hr; 2000 cfm air circulation.

All units: Throwaway filters; 1 in. fiber glass insulation; cabinet 18 gage sheet metal; 2 cylinder semi-hermetic compressor; refrigerant charge "Freon-12" 9 lb.

Installation features: Adaptable to straight duct system, or plenum chamber can be provided; delivered with or without a blower; compact design for attic or utility room installation.

Servicing features: Cleanable condenser; adjustable speed pulley; all controls located in front.

Manufacturer: Lipman Refrigeration Div., Yates-American Machine Co., Beloit, Wis.

Morrison Steel Products

Two ton unit: 24,000 Btu per hr; 850 cfm air circulation; water consumption 3 gal per min, cooling tower rate 6 gal per min; full hermetic compressor.

Three ton unit: 36,000 Btu per hr; 1200 cfm air circulation; water consumption 4.5 gal per min, cooling tower rate 9 gal per min; full hermetic compressor.

Both units: Single phase, 230 volt motor; throwaway filters; 1 in. fiber glass insulation; cabinet 22 gage sheet metal.

Installation features: Refrigeration system, factory charged; unit shipped in two packages; built-in plenum chamber.

Servicing features: Cooling package slides into cabinet as one unit; no separate parts to replace; controls, wiring, etc., accessible from either side; requires no pumping down at end of cooling season.

Manufacturer: Morrison Steel Products, Inc., 601 Amherst St., Buffalo 7, N. Y.

Mueller Climatrol

Two ton unit: 25,922 Btu per hr; 800 cfm air circulation; 2 cylinder semi-hermetic compressor.

Three ton unit: 42,850 Btu per hr; 1200 cfm air circulation; 2 cylinder semi-hermetic compressor.

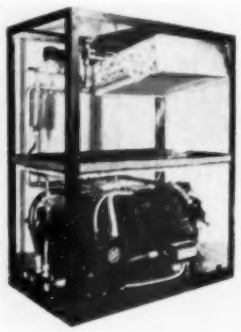
Five ton unit: 66,350 Btu per hr; 2000 cfm air circulation; 3 cylinder semi-hermetic compressor.

All units: Water consumption 1.2 gal per min per ton, inlet 75 F, outlet 95 F; single or 3 phase, 220 volt motor; cabinet, 20 gage sheet metal; throwaway filters; 1 in. fiber glass insulation; refrigerant "Freon-12".

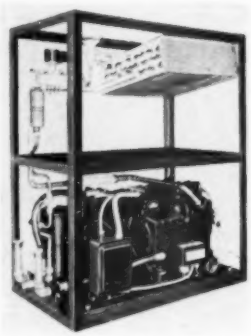
Installation features: System completely pre-wired requiring only connection of electrical power and tie-in to furnace controls.

Servicing features: No service required on system, only replacement of air filters and oiling of blower and blower motor.

Manufacturer: L. J. Mueller Fur-

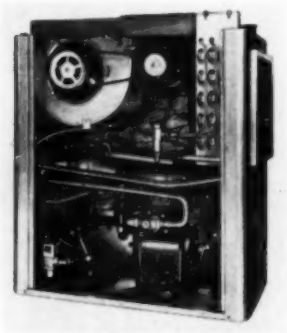


Hupp Corp.

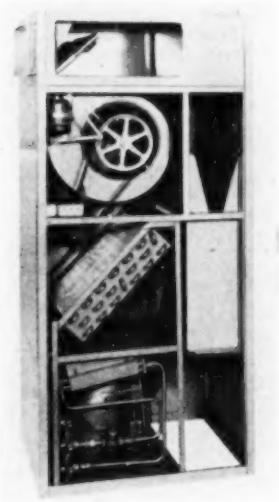


Iron Fireman Mfg. Co.

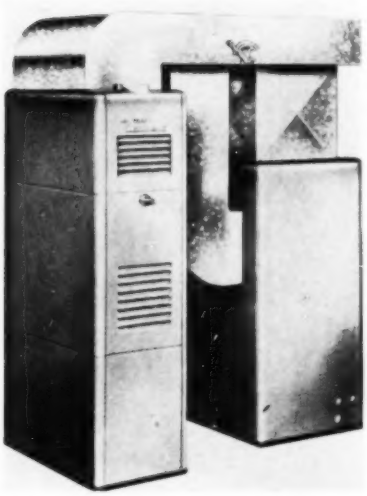
The Lennox Furnace Co.



Lipman Refrigeration Div., Yates-American Machine Co.



Morrison Steel Products, Inc.



L. J. Mueller Furnace Co.

nace Co., 2005 W. Oklahoma Ave., Milwaukee 15, Wis.

Niagara Furnace

Two ton unit: 24,000 Btu per hr; 840 cfm air circulation.

Three ton unit: 36,000 Btu per hr; 1260 cfm air circulation.

Five ton unit: 60,000 Btu per hr; 2100 cfm air circulation.

All units: Water consumption 1.5 gal per min per ton, 80 F inlet, 95 F outlet; single phase, 220 volt motor; ¾ in. fiber glass insulation; cabinet 22 gage sheet metal; throwaway filters; semi-hermetic compressor, 2 and 3 cylinders; refrigerant "Freon-12".

Installation features: Units are shipped completely assembled and tested from the factory.

Servicing features: All parts and controls are readily accessible for servicing or replacement on the job.

Manufacturer: Niagara Furnace Div., The Forest City Foundries Co., 2500 W. 27th St., Cleveland, Ohio

C. A. Olsen

Two ton unit: 24,000 Btu per hr; 800 cfm air circulation.

Three ton unit: 36,000 Btu per hr; 1200 cfm air circulation.

Five ton unit: 60,000 Btu per hr; 2000 cfm air circulation.

All units: Water consumption 1.5 gal per min per ton, 75 F inlet, 95 F outlet; single or 3 phase, 230 volt motor; cabinet 20-23 gage sheet metal; 2 cylinder semi-hermetic compressor; ½ in. fiber glass insulation; refrigerant charge "Freon-12", 3 lb per ton.

Installation features: Kit for cooling tower operation is easily installed, permitting recirculation of water.

Servicing features: Fully accessible for service and replacement of component parts; standard items used throughout assembly.

Manufacturer: The C. A. Olsen Mfg. Co., Filbert St., Elyria, O.

J. V. Patten

Two ton unit: 24,000 Btu per hr; 800 cfm air circulation; water consumption 3 gal per min; 2 cylinder full hermetic compressor.

Three ton unit: 36,000 Btu per hr; 900 cfm air circulation; water consumption 4.5 gal per min; 2 cylinder full hermetic compressor.

Both units: Single or 3 phase, 220 volt motor; throwaway filters; 1 in. fiber glass insulation; cabinet 22 gage sheet metal; refrigerant "Freon-22".

Installation features: Unit is packed in two crates; one contains the condensing unit with hermetically sealed compressor, water valve, evaporator and condensing coils; the other contains the automatic damper, blower, built-in supply plenum chamber, and return air plenum with filters.

Servicing features: The completely assembled condensing unit requires no charging or pumping down at end of cooling season; it slides into the cabinet as one unit, and in the event of failure, is replaced by complete unit; all controls, wiring connections, etc., are accessible from either side.

Manufacturer: J. V. Patten Co., 550 DeKalb Ave., Sycamore, Ill.

Perfection Stove

Two ton unit: 24,000 Btu per hr; 850 cfm air circulation; refrigerant charge "Freon-12" 2.44 lb.

Three ton unit: 36,000 Btu per hr; 1200 cfm air circulation; refrigerant charge "Freon-12" 3 lb.

Both units: One cylinder, full hermetic compressor; single phase, 220 volt motor; throwaway filters; 1 in. fiber glass insulation; cabinet 22 gage sheet metal; water consumption 1.5 gal per ton.

Installation features: Unit is shipped in two packages; one contains the condensing unit complete with hermetically sealed compressor, evaporator and condensing coils completely assembled; the other contains

the cabinet, blower, automatic damper, built-in supply plenum and return air plenum with filters.

Servicing features: Condensing unit completely factory assembled, requires no charging or pumping down at end of cooling season, slides into cabinet as one unit, and in the event of failure, is replaced by complete unit; all controls, wiring, connections, etc., accessible from either side.

Manufacturer: Perfection Stove Co., 7609 Platt Ave., Cleveland 4, Ohio

Quiet-Air

Two ton unit: 26,260 Btu per hr; 800 cfm air circulation.

Three ton unit: 37,120 Btu per hr; 1200 cfm air circulation.

Both units: Water consumption 1.5 gal per min per ton, 75 F inlet, 95 F outlet; single or 3 phase, 230 volt motor; cabinet 18 gage sheet metal; throwaway filters; 2 cylinder full hermetic compressor; ½ in. fiber glass insulation; refrigerant "Freon-22".

Installation features: Completely assembled with refrigeration cycle hooked up and ready to run; duct flanges furnished as part of unit; compact design.

Servicing features: Entire refrigeration cycle is welded into a hermetic unit — if service is required, entire system can be quickly replaced.

Manufacturer: Quiet-Air Mfg. Div., Abco Refrigeration Supply Co., 1615 Second Ave., New York 28, N. Y.

Schnacke

Three ton unit: 36,000 Btu per hr; 1200 cfm air circulation; water consumption 3.75 gal per min; refrigerant charge "Freon-12" 6 lb, compressor 2 cylinder semi-hermetic.

Five ton unit: 60,000 Btu per hr; 2000 cfm air circulation; water consumption 6.25 gal per min; refrigerant charge "Freon-12" 8 lb, compressor 4 cylinder semi-hermetic.

Both units: Single or 3 phase, 230 volt motor; cabinet, rust proofed, enameled and insulated; throwaway filters.

Installation features: All units are internally piped and wired; can be used in multiple hook-up for greater capacity; controls adjusted at factory.

Servicing features: All parts accessible from front panel; ample work space inside cabinet; gages can be attached from front.

Manufacturer: Schnacke, Inc., 1101 N. Governor St., Evansville, Ind.

Niagara Furnace Div., Forest City Foundries Co.

Servel

Two ton unit: 24,000 Btu per hr; 800 cfm air circulation.

Three ton unit: 40,000 Btu per hr; 1200 cfm air circulation.

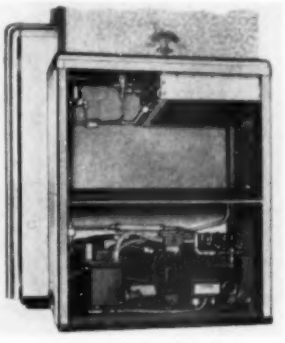
Five ton unit: 65,000 Btu per hr; 2000 cfm air circulation.

All units: Water consumption 2 gal per min per ton, 75 F inlet, 105 F outlet; single phase, 115 or 230 volt motor; cabinet 0.035 in. sheet metal gage; throwaway filters; gas fired hermetically sealed absorption refrigeration system.

Installation features: Filter section can be inverted to provide low horizontal connection or top and bottom intake; discharge collar can be arranged for either horizontal or upward discharge.

Servicing features: Access doors located in both front and rear; filters may be changed through either door.

Manufacturer: Servel, Inc., 119 Morton Ave., Evansville 20, Ind.



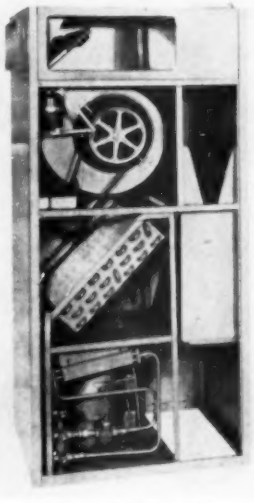
C. A. Olsen Mfg. Co.

Thatcher

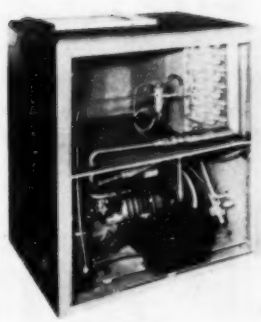
Two ton unit: 24,000 Btu per hr; 800 cfm air circulation.

Three ton unit: 36,000 Btu per hr; 1200 cfm air circulation.

Five ton unit: 60,000 Btu per hr; 2000 cfm air circulation.



Perfection Stove Co.



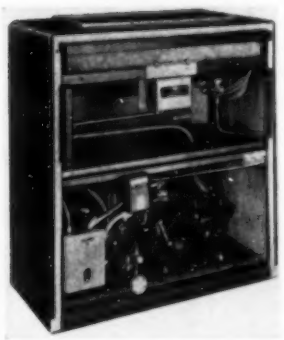
Schnacke, Inc.

All units: Water consumption 1.5 gal per min per ton, 75 F inlet, 95 F outlet; single or 3 phase, 220 volt motor; ½ in. fiber glass insulation; cabinet 16 gage sheet metal; throwaway filters; semi-hermetic compressor, 2 or 3 cylinders; refrigerant "Freon-12".

Installation features: Integral blower with 220 volt motor; low voltage heating and cooling thermostat furnished; water and electrical connections can be brought in from either side.

Servicing features: Semi-hermetic compressor; all controls in front, easily accessible.

Manufacturer: Thatcher Furnace Co., Centre St., Garwood, N. J.



United States Air Conditioning Corp.

United States Air Conditioning

Two ton unit: 24,000 Btu per hr; 800 cfm air circulation; 2 cylinder semi-hermetic compressor; water consumption 3.0 gal per min; refrigerant charge "Freon-12" 5 lb.

Three ton unit: 36,000 Btu per hr; 1200 cfm air circulation; 2 cylinder semi-hermetic compressor; water consumption 4.5 gal per min; refrigerant charge "Freon-12" 7 lb.

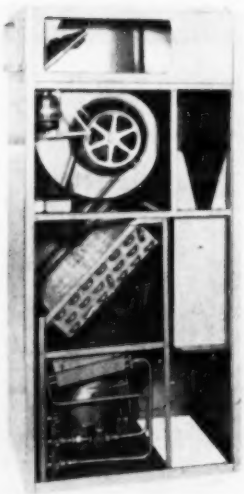
Five ton unit: 60,000 Btu per hr; 2000 cfm air circulation; 4 cylinder semi-hermetic compressor; water consumption 7.5 gal per min; refrigerant charge "Freon-12" 11 lb.

All units: ½ in. fiber glass insulation; shell and finned coil condenser; three position switch for off, fan only, and cooling, with automatic thermostat operating compressor; single or 3 phase, 220 volt motor; cabinet 18 gage sheet metal.

Installation features: Adaptable to supply duct installation with damper to divert air through cooling unit in summer and bypassing cooling unit in winter.

Servicing features: Front panel removable; controls located in easily accessible spots.

Manufacturer: United States Air Conditioning Corp., Como Avenue S.E. at 33rd, Minneapolis 14, Minn.



Viking Air Conditioning Corp.

Viking Air Conditioning

Two ton unit: 24,000 Btu per hr; 800 cfm air circulation; water consumption 3 gal per min; 2 cylinder full hermetic compressor.

Three ton unit: 36,000 Btu per hr; 900 cfm air circulation; water consumption 4.5 gal per min; 2 cylinder full hermetic compressor.

Five ton unit: 60,000 Btu per hr; 1500 cfm air circulation; water consumption 7.5 gal per min.

All units: Single or 3 phase, 220 volt motor; throwaway filters; 1 in. fiber glass insulation; cabinet 22 gage sheet metal; refrigerant "Freon-22".

Installation features: Unit is packed in two crates; one contains the condensing unit with hermetically sealed compressor, water valve, evaporator and condensing coils, completely assembled; the other contains the automatic damper, blower, built-in supply plenum chamber, and return air plenum with filters.

Servicing features: The completely assembled condensing unit requires no charging or pumping down at end of cooling season; it slides into the cabinet as one unit, and in the event of failure, is replaced by complete unit; all controls, wiring, connections, etc., are accessible from either side.

Manufacturer: Viking Air Conditioning Corp., 5601 Walworth Ave., Cleveland 2, Ohio

Waterman-Waterbury

One and one-half ton unit: 18,000 Btu per hr; 600 cfm air circulation.

Two ton unit: 24,000 Btu per hr; 800 cfm air circulation.

Three ton unit: 36,000 Btu per hr; 1200 cfm air circulation.

Five ton unit: 60,000 Btu per hr; 2000 cfm air circulation.

All units: Water consumption 1.5 gal per ton, 85 F inlet, 95 F outlet; single phase, 220 volt motor; cabinet 22 gage sheet metal; throwaway filters; 2 cylinder full hermetic compressor; 1 in. fiber glass insulation; refrigerant "Freon-12".

Installation features: Unit completely assembled, including casing.

Servicing features: All parts accessible through access door.

Manufacturer: Waterman-Waterbury Co., 1122 Jackson St., N.E., Minneapolis 13, Minn.

Westinghouse

Three ton unit: 36,000 Btu per hr; 1200 cfm air circulation; refrigerant charge "Freon-12" 8 lb.

Five ton unit: 60,000 Btu per hr; 2000 cfm air circulation; refrigerant charge "Freon-12" 12 lb.

Both units: Water consumption 1.5 gal per ton; 2 cylinder semi-hermetic compressor; throwaway filters; cabinet, 0.040 gage sheet metal; single or 3 phase, 220 volt motor; 1 in. fiber glass insulation.

Installation features: Available with or without fan, fan motor, and drive; available with rear or bottom return air inlet; side returns may be cut in panels; water valve included and attached.

Servicing features: All parts accessible from front; all panels individually removable.

Manufacturer: Westinghouse Electric Corp., Sturtevant Div., 105 Readville St., Hyde Park, Boston 36, Mass.

Williams Air-O-Matic

Two ton unit: 24,000 Btu per hr; 800 cfm air circulation.

Three ton unit: 36,000 Btu per hr; 1200 cfm air circulation.

Five ton unit: 60,000 Btu per hr; 2000 cfm air circulation.

All units: ½ in. fiber glass insulation; throwaway filters; refrigerant "Freon-12"; 2 cylinder semi-hermetic compressor; cleanable condenser; water regulating valve; water consumption, 1.5 gal per ton; single or 3 phase, 220 volt motor; cabinet 18 gage sheet metal.

Installation features: Refrigerant charged at factory; electrical system completely wired and tested before shipping.

Servicing features: Fan assembly can be installed in cooling unit to add to capacity of blower system where needed.

Manufacturer: Williams Div., Eureka Williams Corp., 1201 E. Bell, Bloomington, Ill.

York

One and one-half ton unit: 19,100 Btu per hr; 770 cfm air circulation.

Two ton unit: 25,700 Btu per hr; 840 cfm air circulation.

Three ton unit: 41,640 Btu per hr; 1500 cfm air circulation.

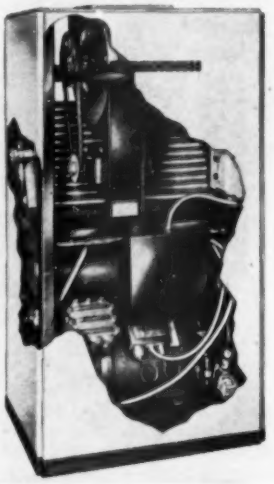
Five ton unit: 60,000 Btu per hr; 2100 cfm air circulation.

All units: Water consumption 1.5 gal per ton, 75 F inlet, 95 F outlet; single phase, 230 volt motor; ½ in. fiber glass insulation; cabinet 18 and 20 gage sheet metal; throwaway filters; 3 cylinder full hermetic compressor; refrigerant "Freon-22".

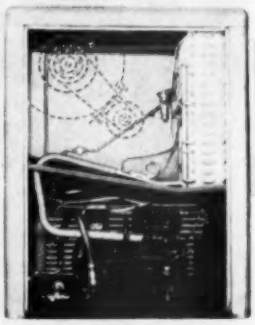
Installation features: Separate circuits are fully assembled, hermetically sealed at factory; jacket has rigid slip-joint construction.

Servicing features: Separate refrigerant circuits can be removed singly without disturbing rest of installation; separate circuit connections easy to handle; unit operates even with one circuit removed for service; circuits serviced easily and separately, either in or out of unit.

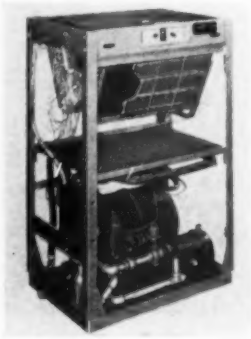
Manufacturer: York Corp., Roosevelt Ave., York, Pa.



Westinghouse Electric Corp.



Williams Div., Eureka Williams Corp.



York Corp.

THERE ARE MANY WAYS to cool a residence. Future Artisan surveys will be devoted to other makes of complete packaged central units, their various components (compressors, for example), and to equipment furnishing cooling by other than mechanical refrigeration.

What Do You Say?

You are invited to express your views — for publication here — on matters of interest to those concerned with residential air conditioning, warm air heating and sheet metal contracting. Address your comments to the Editor, American Artisan, 6 N. Michigan Ave., Chicago 2

COPPER ROOF FLASHINGS DO LAST

WE ARE sheet metal fabricators and installers, so I don't see how we could endorse the idea that mineral surface base flashing is better than copper base flashing, as seems to be implied in the last paragraph of the article, *Making Copper Roof Flashings Last,* by L. E. Gichner, which appeared in a recent issue of American Artisan. We have seen copper flashings and roofing last 50 years and more.

Cap flashing very seldom deteriorates. We never lock our cap flashing. We always install each 8 or 10 ft joint "free" by overlapping each vertical joint 3 in. One uses more material this way, but it is a lasting job.

Then too, the topic of how much or how little to fasten is quite controversial. There is one school of thought that goes along the line of leaving as much of the work free as possible to expand and contract. The other side takes the stand for close and firm fastening. I, personally, go along with the latter.

We think that the problem is to prevail upon the architects to specify the proper weight of copper for the type of job for which it is to be used. Also, to maintain the integrity of the trade, accepted good installation procedures (as shown in *Standard Practice in Sheet Metal Work,* Manuals No. 1 and No. 2, put out by the Sheet Metal Contractors' National Association) should be used. Since the entire building is protected by the roofing and flashings, these should be of the best.

In conclusion, we still believe that copper is one of the best metals for flashing, roofing and ornamental work, if the proper weight is specified and the metal worked with intelligence and by approved methods.

A. E. GRUMNEY, The Riester & Thesmacher Co.

FIGURING HEAT PUMP COSTS

IN REGARD to the article *Estimating the Energy Consumption of Residential Heat Pumps,* recently published in the American Artisan, I should like to point out that the average person is more interested in a formula on a cost of operation which he can easily figure and which is the result of many hours of actual operation.

Our heat pumps have been operating in practically all parts of the country for a number of years. After an operation of better than 15 million hours, we believe that the formula we have arrived at on operating cost of the units is pretty accurate. This formula is one Kwhr per degree day per 40,000 Btu heat load. The degree day is based on the house temperature or the thermostat setting and the unit operation is based on 50 F or over source water.

As an example, if there are 5000 degree days and the Btu loss of the home is 80,000 at the design temperature, you would have 5000 times 2 or 10,000 Kwhr per year for heating. You multiply the Kwhr by the cost per Kwhr, which in Muncie, Ind., averages 1½ cents, and you get the cost of heating per season, which, in this case, would be $150.00.

This is not an actual example for Muncie because the average degree day record is about 5300 at 65 F and not house temperature.

MARVIN SMITH, Muncie Gear Works, Inc.

COMPARES TWO METHODS

IN REFERENCE to the article on energy consumption of residential heat pumps, I feel that the degree day method should give more reliable results than the heat loss method.

The heat consumption of a building calculated by the heat loss method is usually too high because this method neglects solar radiation and heat gains from people, lights, cooking, etc. Another point in favor of the degree day method is that it is based on experience.

S. S. SANFORD, The Detroit Edison Co.

ASHVE Reports $2 Million for Research

HEALTH, COMFORT, efficiency and industrial progress are the aims of the research in heating, ventilating and air conditioning carried on by The American Society of Heating and Ventilating Engineers in its laboratory and in cooperation with leading colleges, universities and Governmental agencies, according to a publication, *ASHVE Research Goals,* issued by the Society recently.

Since 1919, close to $2,000,000 has been expended for ASHVE research, which has helped guide the industry to better processes and equipment, it is reported. Research expenses for 1953 are budgeted at about $174,000.

Listed among the major accomplishments of the Society's research in the past 33 years are: the establishment of conditions for human comfort; development of the ASHVE Comfort Chart; determination of heat transmission coefficients for building materials; thermo-dynamic properties of air and water vapor mixtures; physiological effects of hot and humid atmospheres and means of alleviating human distress; physical laws governing the behavior of air distribution jets; heating load calculations; and cooling load calculations.

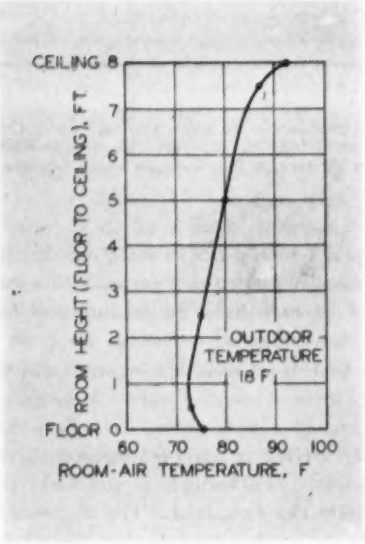


FIG. 1 — A CEILING PANEL system over a concrete slab floor effected air temperature gradients at the center of the room of 16 deg, from ceiling to floor, showing that heat transfer could bring warm floor surfaces

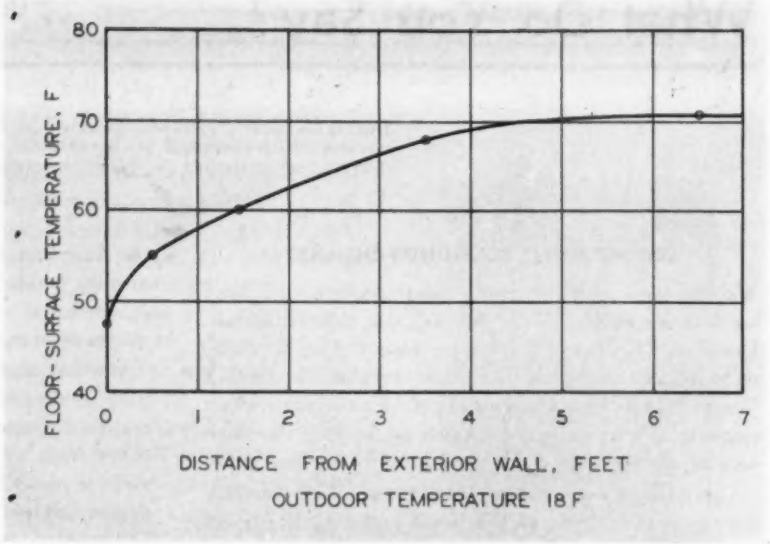


FIG. 2 — FLOOR SURFACE temperatures near the exposed wall indicate that edge insulation could have been used to advantage, as could higher ceiling surface temperatures over the outside edge

Floor Panel-Convection System Solves Heating Problem

. . . in a slab floor house, where partially opening a closed floor system brought better temperature gradients and thermostatic control, with warm floor surfaces. Also compared is a ceiling panel system

R. W. Roose and S. Konzo
University of Illinois

EARLY FIELD reports of the performance of a warm air ceiling panel system installed in a house built upon a concrete slab floor were generally favorable. Floors were found to be somewhat warmer than those heated by conventional systems as a result of radiation heat transfer from the warm ceiling to the cooler floor.

One of the early studies in the field was made in 1946 in a small office building [*Warm Air Ceiling Panel* (*Closed System*), American Artisan, July, 1947]. The room air temperature gradient in the center of the room is shown in Fig. 1. The floor surface temperature (76 F) was about 3 F higher than the air temperature measured 6 in. above the floor. For an outdoor temperature of 18 F and a thermostat setting of 75 F, the ceiling surface temperature in the middle of the room was 92 F. Hence, the heat transfer from the warm ceiling to the floor resulted in a warm floor surface.

The floor surface temperatures nearer the exposed wall are shown in Fig. 2. Edge insulation was not used in this office building so that the floor surface temperatures near the exposed edge were undoubtedly lower than if adequate edge insulation had been applied. The surface temperatures were only 47 F near the exposed wall, 60 F at 1½ ft distance from the wall, and 66 F at a distance of 3 ft from the wall. Some

improvement in the floor-surface temperatures might have resulted if it had been possible to provide higher ceiling surface temperatures near the exposed wall so that a greater radiation heat transfer could have been effected. In any case, the use of edge insulation is indicated.

In general, the closed ceiling panel system was not especially effective in counteracting the cool air dropping off the windows and settling near the floor. This was particularly noticeable in houses which were provided with extensive areas of single glazed windows, for which the volume of cool air cascading down the windows was large, and the air temperature of the air stream was low.

In summary, therefore, the warm air ceiling panel system with the closed air circuit was found to give: a) highly satisfactory results in houses with basements; b) satisfactory results in houses with crawl spaces; and c) partially satisfactory results in houses with concrete slab floors.

Floor Panel Heating Has Advantages

A tremendous amount of interest was shown in the closed floor panel

DEVELOPMENT OF WARM AIR PERIMETER HEATING

This is the third of a series of articles showing a detailed development of the warm air perimeter type of heating system. In this series some of the published technical data resulting from investigations conducted at the University of Illinois in the Warm Air Heating Research Residences will be interpreted for the heating contractor. This research work has been sponsored by the National Warm Air Heating and Air Conditioning Association and is directed by the Research Advisory Committee of that body. In addition, some extracts will be made from the design and installation codes and manuals developed by the Installation Codes and Technical Education Committee of the Association.

Articles So Far Have Covered:

1. Heating basementless homes (January issue)
2. Warm air ceiling panels (February issue)
3. Heating slab floor homes with ceiling and floor panel systems (this issue)

Future Articles Will Treat:

1. Survey of field practices
2. Early practices in perimeter heating
3. New research residence built
4. Comparison of two-loop perimeter system and three convection systems
5. Comparison of perimeter loop system and two-loop system
6. Perimeter laboratory studies
7. Crawl space heating studies
8. 8 in. loop system *vs.* 6 in. loop system
9. Loop *vs.* radial system

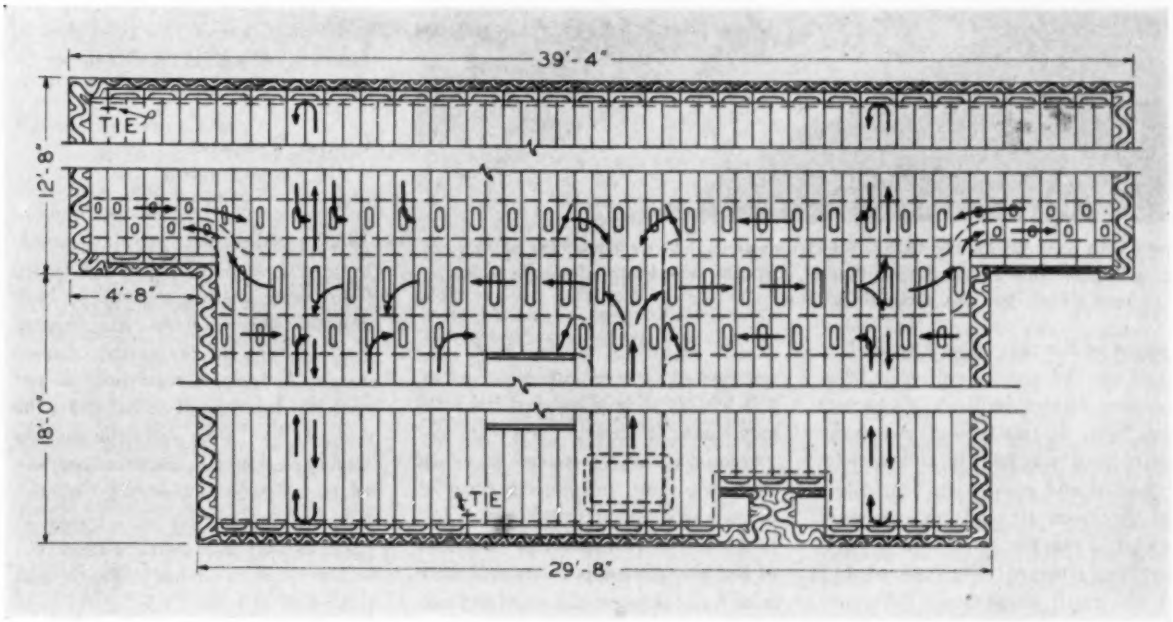


FIG. 3 — AMONG THE ADVANTAGES found in using a closed floor panel system to heat slab floor homes was the small temperature difference between air at floor level and breathing level

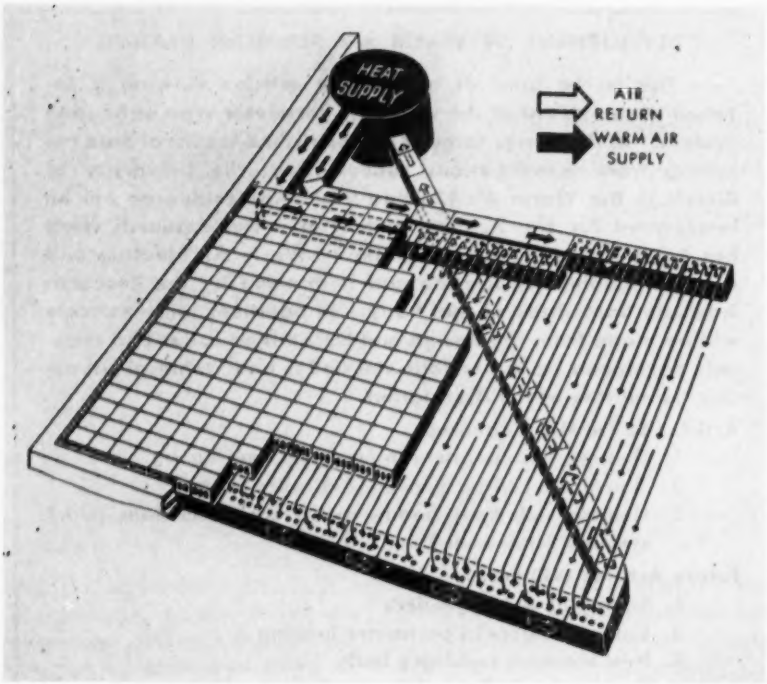


FIG. 4 — WARM AIR WAS circulated through an extensive system of hollow tiles toward the perimeter of this house. There, return air was collected and sent directly back to the furnace

FIG. 5 — HOLLOW CORE, pre-cast concrete slabs were used for heating larger buildings. In this application, the slabs served not only as the floor and ceiling, but also as an air conduit

system of the type illustrated in Fig. 3, as applied to the heating of basementless houses built on a concrete slab floor. In this type of system the entire floor was heated, and then by radiation and convection heat transfer the room air and surfaces were heated. From the standpoint of comfort performance as measured by: a) the small temperature difference between the air at the floor level and the breathing level, b) the warm floor surfaces, and c) the uniformity of the air temperatures in the living zone at various parts of the room, this system showed marked improvements over results obtained with conventional warm air systems in which heat was not introduced into or below the floor.

A number of interesting variations of the closed floor panel system were tried by building contractors and material suppliers during this transition period. Most of the schemes utilized ordinary or specially designed building products, either as a part of the concrete slab or below it. Warm air was circulated through these building products in various ways:

An extensive system of hollow tiles is shown in Fig. 4. In this application the warm air was circulated toward the perimeter of the house, at which point the return air was collected and returned directly to the furnace.

A modification of this tile sub-flooring was used, in which the warm air travelled toward the perimeter of the building, but returned through the adjoining tile.

Hollow-core, pre-cast concrete slabs, as shown in Fig. 5, also were used. The most extensive applications of this material were for large buildings, such as churches, as floors over basement spaces and as floors for the upper stories of office buildings. In this case, the pre-cast slab served not only as the floor and ceiling, but also as an air conduit.

In a few cases the concrete floor slab was elevated above a sub-floor by means of piers of brick spaced uniformly apart. The air space between the upper and lower slabs served as the air passage for the circulating warm air.

A few installations were made with a series of small ducts connected to a trunk duct which extended the length of the house. The small ducts were connected at right angles to the trunk duct and extended outwards to the exposed edges of the house. The air was turned 180 deg at the perimeter and was returned to a return air trunk duct.

Comparatively little reliable data is available on floor panel heating systems, regardless of the medium used for heating the floor. In this connection, however, a good deal of information was gleaned from an installation in a certain home.

Unique Features Of Construction

This particular residence, built in 1945, was designed for solar orientation and was provided with a closed floor panel heating system. In both respects the residence was unique. For example, the percentage of glass area to floor space was about 55 per cent. At the time of construction the designer had little authentic data to rely upon, so that the structure can be considered a pioneering venture in solar orientation as well as in panel heating with warm air.

The floor, as shown in Fig. 6, was composed of hollow tiles of the type shown in Fig. 4. The warm air was delivered from the furnace to the three supply tiles which are indicated

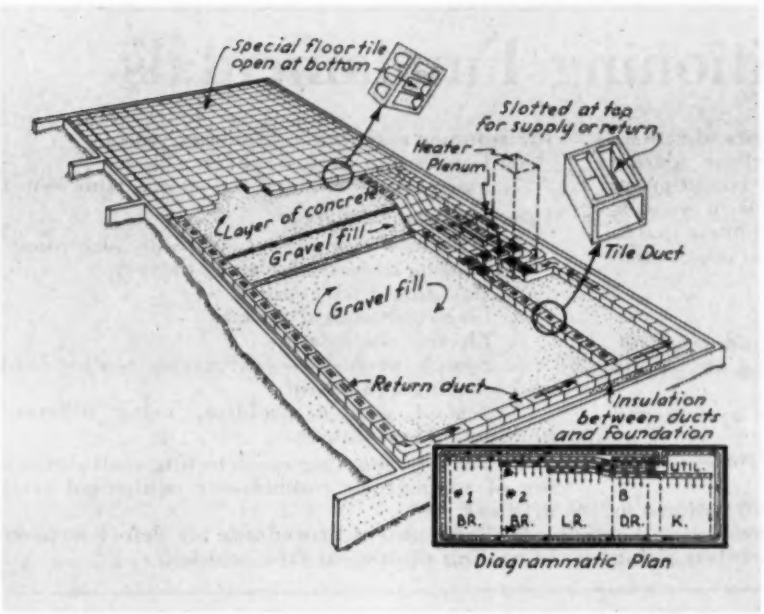


FIG. 6 — THE TEMPERATURE CONTROL of this closed floor system was not satisfactory because the house had large solar orientation. Hollow tiles were used to carry the warm air

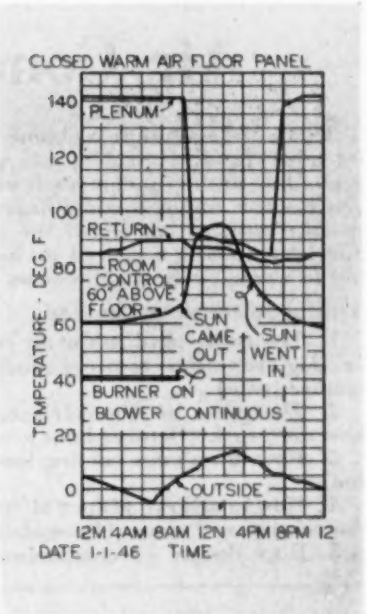


FIG. 7 — TEMPERATURE records of the closed floor panel test were kept for a 24 hr period, during which outdoor air temperature ranged from about −5 to 15 F. The blower operated continuously

in the diagrammatic plan. The special floor tile which was used to carry the warm air from the supply to the return also served as the finished floor. The first test arrangement was a completely closed system in which none of the circulating air was admitted into the room.

Closed System Gives Unsatisfactory Performance

In Fig. 7 are shown temperature records for a 24 hr period when the outdoor air temperature ranged from about −5 F to 15 F. During this entire period the blower was operating continuously.

From midnight to 7:00 a.m. the burner operated continuously, the plenum air temperature was about 140 F, and the room air temperature remained about 62 F. The heat emission from the panel was not sufficient to maintain a higher room air temperature, and indicated that higher plenum air temperatures and burner input rates were required.

From 7:00 a.m. to 10:00 a.m. the burner was still operating continuously, and some evidence existed that the plant was slowly catching up with the demand. Both the return air temperature and the room air temperature started a slow climb during this period before the sun effect was noticeable.

From 9:00 a.m. to 4:00 p.m. the sun effect was distinctly noticeable in this house, which was designed to capture the maximum of winter sunlight. The solar heat pouring through the south windows caused the burner to shut off at 10:00 a.m. The plenum air temperature dropped sharply from 140 F to 95 F. However, the indoor temperature increased at a phenomenal rate until a temperature of 95 F was recorded at 2:00 p.m. The indoor conditions were above the comfort range until about 4:00 p.m. During this 7 hr period, the return air temperature decreased slowly, the blower was operating continuously, and the cooling of the panel merely contributed heat to the room which was already overheated.

From 4:00 p.m. to midnight the absence of solar heating effect resulted in an undershooting of room air temperatures. The room air temperature decreased sharply after 4:00 p.m., the burner started operating continuously about 6:30 p.m., and not until about 8:00 p.m. was the full heat emission rate from the floor slab obtained. The time lag was large, and by 10:00 p.m. the room air temperatures were dropping below 60 F.

From the data obtained, it can be seen that the temperature control of this closed floor panel system used in conjunction with a house with large solar orientation was far from satisfactory.

As shown in Fig. 8 (on page 121), a heated floor panel did not result in the elimination of cool air drafts from the large glass areas. At the base of the windows the measured air velocities ranged from 75 to 100 fpm. This cool air traveled across the floor for a distance of about 3½ ft and probably would have been the source of complaint of objectionable drafts.

Some Supply Air Allowed to Enter Rooms

In view of the fact that the closed floor panel system left much to be desired, the next series of tests provided for a simple modification. It was decided to open the floor panel along the outer wall so that part of the supply air could enter the rooms below the large glass areas before it was returned to the furnace. The system would then be a combination of panel heating and convection heating. It was hoped that the house could at least be made comfortably warm even after the sun went down.

Therefore, a long narrow slot about 1 in. wide was provided along

(*Please turn to page* 121)

Air Conditioning Fundamentals

This is the seventh in a planned series of articles intended to give readers of American Artisan grounding in the fundamentals of air conditioning systems for summer and winter, and to provide specific information on all the component parts. Special emphasis is placed on how to adapt cooling to warm air heating systems.

Articles So Far Have Covered:

1. The terms used in the air conditioning field, i.e., air properties, comfort conditions, etc. (September issue)
2. The parts of the refrigeration system and how they work (October issue)
3. How to estimate cooling loads (November issue)
4. How to achieve proper air stream patterns in the conditioned space (December issue)
5. Duct design — comparison between sizing for summer and winter (January issue)
6. Condensing units (February issue)
7. Fans, fan motors and fan speeds (this issue)

Future Articles Will Treat:

1. Filters — throwaway, cleanable, electronic
2. Cooling towers (also water valves)
3. Equipment selection
4. Electrical control systems
5. Electric controls
6. Sample problem — estimating cooling load and selecting equipment
7. Second sample problem, using different building and conditions
8. Trouble shooting — detecting malfunctioning of summer air conditioning equipment (two articles)
9. Replacement procedures for defective parts in cooling equipment (two articles)

What Happens When You Change Fan Speeds?

Knowledge of the fan laws helps when increasing air circulation for cooling

FUNDAMENTAL TO the art of air conditioning is air motion. Air is the carrier of heat to or from, humidity to or from, and dust from the conditioned space. Without mechanical means to move air, comfort cooling would have to depend upon gravity circulation of air past bare pipes, such as are used in cold storage warehouses. Such costly and unsightly installations would not be tolerated in homes, restaurants, and stores, nor could conditions of comfort be as precisely controlled as they are with conventional systems where air is circulated mechanically. Because of the basic importance of the moving air stream, it should be worthwhile every so often to pause and reconsider the means by which we circulate air — the fan.

Strictly speaking, the contractor engaged in commercial and residential work could limit his knowledge of fans to just one type, the familiar forward curved blade centrifugal fan, and get by very nicely. A well-informed man, however, will need to be familiar with some of the important characteristics of other types of fans. Knowledge of these will at least help him to understand why the forward curved blade centrifugal fan is in such prominent use for moving air through ducts.

What types of fans are now available to the contractor? Fans may

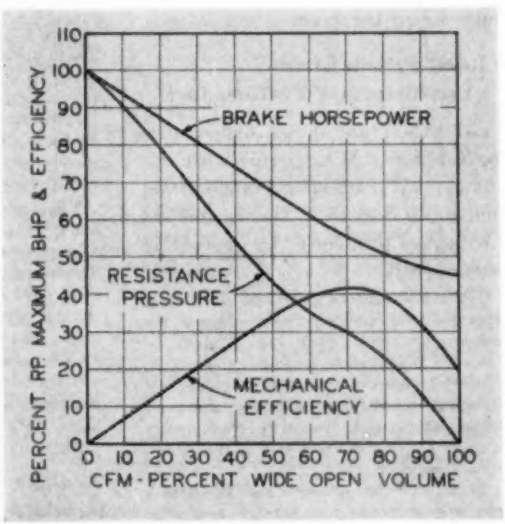


FIG. 1 — FOR A TYPICAL propeller fan, power rises sharply with decreased air flow, requiring careful motor selection to prevent overloading

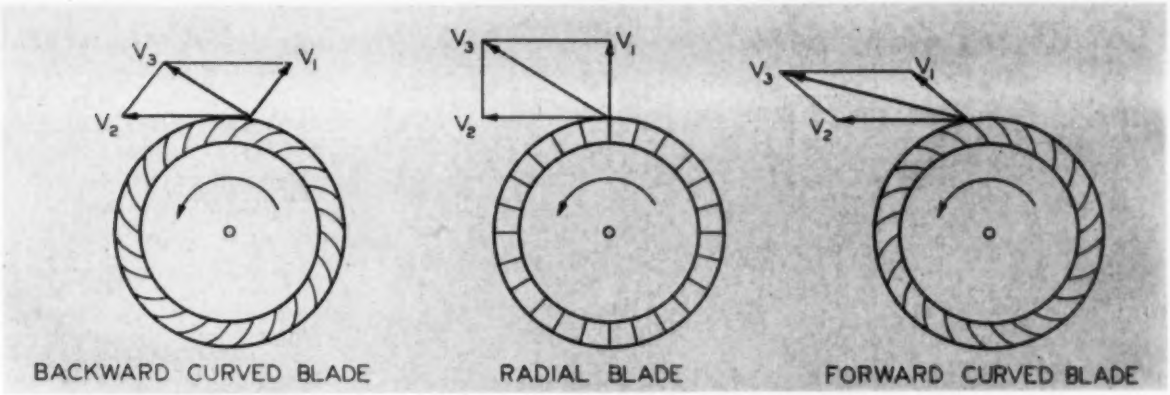


FIG. 2 — CENTRIFUGAL FANS can be typed on the basis of blade characteristics — whether blades are straight, or are curved away from or in the direction of rotation. Arrow V_1 represents velocity of air parallel to the blades; V_2, velocity imparted to the air by the rotation; V_3, the total velocity

be classified as follows: 1) propeller or disc-type fans; 2) axial flow fans; 3) centrifugal fans (radial blades, backward curved blades, forward curved blades).

Propeller type fans consist of a number of wide blades mounted on a hub. These fans are commonly located on a desk, floor, or wall for local circulation of air in a room. They are also used as exhaust fans in kitchen or attic locations. In refrigeration work they are often used on air cooled condensing units, and in air conditioning work they are commonly used in cooling towers. Fans of this type are seldom used where resistance pressures are more than 0.5 in. water or where velocities are more than 1500 fpm. Because they are low in first cost and require a minimum of space, they are more popular than centrifugal type fans for free or near free air delivery.

Noise resulting from the high speeds needed to overcome any appreciable resistance pressure is a factor making them undesirable for this application. Fig. 1 shows horsepower and pressure characteristics for a typical propeller fan. Notice particularly how power rises with decreased flow of air. This necessitates a very careful motor selection where propeller fans operate against resistance, since any restriction to flow can cause a motor to overload if it is not sized properly.

The axial flow fan, though rarely encountered in commercial practice, is becoming more popular in industrial work and for special work where its small size and large capacity make it especially desirable. This fan may be compared to the propeller-type fan in that air flows parallel to the axis of the fan wheel. It differs from the propeller fan in that precisely engineered air foil section blades are used and mounted in very large hubs. The wheels are mounted within cylinders and can be designed to operate against extremely high pressures. Depending upon the design and pitch of the blades, the pressure characteristic of this type of fan can be made to resemble either the backward or the forward curved centrifugal fan.

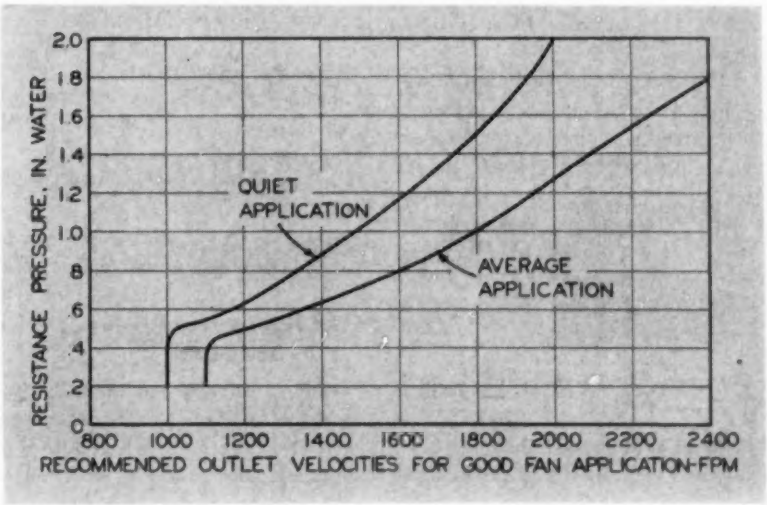


FIG. 3 — THESE CURVES may be used as a guide in selecting forward curved blade fans, which require low speeds

Centrifugal Fans Classified

Blade characteristics are used to type centrifugal fans. The radial blade fan has straight blades placed radially. The backward curved blade fan has blades which curve away from the direction of rotation, and the forward curved blade fan has blades which curve in the direction of rotation. In each type of centrifugal fan the blades are arranged to form a cylinder which rotates about an axis as shown on Fig. 2.

In addition to classifying centrifugal fans by their blade types, the fan industry, through the National Association of Fan Manufacturers, has set up four classes of operating limits for fans. These are:

Class 1—3¾ in. maximum total pressure
Class 2—6¾ in. maximum total pressure
Class 3—9¾ in. maximum total pressure
Class 4—over 9¾ in. maximum total pressure

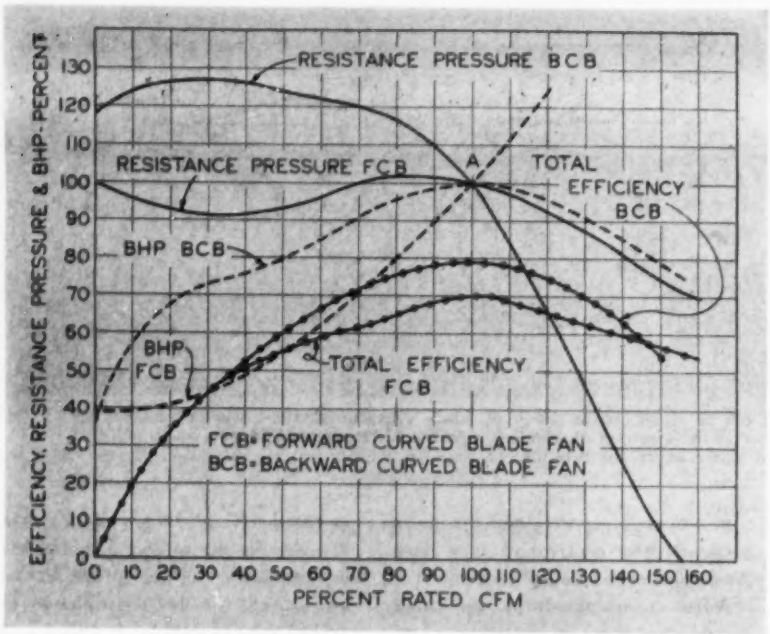

RESISTANCE PRESSURE BCB
RESISTANCE PRESSURE FCB
A
TOTAL EFFICIENCY BCB
BHP BCB
BHP FCB
TOTAL EFFICIENCY FCB
FCB-FORWARD CURVED BLADE FAN
BCB-BACKWARD CURVED BLADE FAN
EFFICIENCY, RESISTANCE PRESSURE & BHP-PERCENT
PERCENT RATED CFM
0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160
0 10 20 30 40 50 60 70 80 90 100 110 120 130

FIG. 4 — CURVES FOR forward and backward curved blade fans are plotted so that 100 per cent rated cfm corresponds to the point of maximum mechanical efficiency

The design and construction standards for the various classes differ in accordance with the duty required of the fan. The classification aids in the selection of fans which are more nearly designed for a specific duty.

In each type of centrifugal fan air enters the wheel in a direction parallel to the fan shaft. It then turns approximately 90 deg and flows through the blades. The manner in which air leaves the wheel varies with the type of blades used as shown on Fig. 2. The arrow V_1 represents the velocity of the air parallel to the blades, whereas V_2 represents the velocity imparted to the air by the rotation of the wheel. When these component velocities are added, the resultant velocity is as represented by V_3. If it be assumed that all three wheels are operating at the same speed (rpm), then V_2 will be the same for each case. Assuming that V_1 has the same magnitude in each case it should be quite obvious that the resultant air velocity, V_3, will be greatest for the forward curved blade fan and least for the backward curved blade fan.

Put another way, we could say that for the same air velocity (and therefore the pressure developed) a forward curved blade fan will require the lowest speed and a backward curved blade fan will require the highest speed. The lower speeds are accompanied by lower noise levels. Here then is one point in favor of the forward curved blade fan for air conditioning work. A good index of noise level for centrifugal fans is the tip speed of the wheel and its related quantity, the outlet velocity of the fan. Most fan manufacturers supply information on noise characteristics of fans. Fig. 3 may be used as a guide in selecting forward curved blade fans.

The forward and backward curved blade fans represent the two extremes of centrifugal fan design. Between these are the radial blade fan and many other variations of design which exhibit characteristics similar to one or the other extremes. Therefore, for our purposes, it will suffice to examine only the operating characteristics of the extremes.

Compare Forward and Backward Curved Blade Fans

Fig. 4 shows typical efficiency, resistance pressure, and horsepower curves for both forward and backward curved blade fans. The curves are plotted so that 100 per cent rated cu ft per minute (cfm) corresponds to the point of maximum mechanical efficiency. Resistance pressure and brake horsepower are also assumed to be 100 per cent at this point.

A comparison between forward and backward curved blade fans shows that:

1. The resistance pressure curve of the forward curved blade fan has a characteristic hollow or dip at low air quantities. In this region the fan is noisy and pulsates, although air quantity and resistance pressure in this region are definitely predictable and fan operation is stable.
2. The forward curved blade fan has a much lower speed, about half that required by a backward curved blade fan for the same duty. Lower speed means quieter operation.
3. Forward curved blade fans are smaller for a given duty than backward curved blade fans.
4. Although the maximum efficiency of each type fan is about the same, the maximum efficiency of the forward curved blade fan occurs much closer to the peak of the pressure curve than it does for the backward curved blade fan.
5. The forward curved blade fan is characterized by an increasing horsepower curve at the same speed as resistance pressure is decreased. Fan motors on this type fan can be overloaded if system resistance should drop sufficiently. The backward curved blade fan has a horsepower curve which increases to a maximum with cfm increase, then decreases. For a given speed there is always a maximum horsepower requirement which can be used as a basis for motor selection to prevent overloading.
6. As shown on Fig. 4, the resistance pressure curve for the backward curved blade fan is much steeper than is the corresponding curve for the forward curved blade fan for the same duty. The backward curved blade fan is, therefore, much less sensitive to system resistance miscalculations than is the forward curved blade fan.

Having discussed the general operating characteristics of both the forward and backward curved blade fans, we shall now confine our attention to only the forward curved blade fan, since the other type is rarely, if ever, found in residential air conditioning practice.

Use Fan Laws to Predict Performance

For predicting fan performance certain mathematical expressions, known as fan laws, are useful. For instance, when a given fan is operating against a given duct system the following relationships apply:

1. Capacity (cfm) varies directly as the fan speed (rpm).

2. Static pressure varies as the square of the fan speed.

3. Horsepower varies as the cube of the fan speed.

4. At constant speed and capacity, static pressure and horsepower vary directly as the density and barometric pressure of the air.

There are other relationships, but those listed above are the most useful for everyday work. A complete statement of fan laws may be found in the ASHVE Guide.

To illustrate how the fan laws are used, assume that a fan selected from a manufacturer's table is rated to deliver 1200 cfm at a static pressure of 1 in. water gage when running at a speed of 600 rpm and requiring 0.32 bhp. If the speed is changed to 500 rpm, the cfm, static pressure and bhp will change to the following:

$$\text{Capacity} = (500/600) \times 1200 = 1000 \text{ cfm}$$

$$\text{Static pressure} = (500/600)^2 \times 1 = 0.694 \text{ in. water}$$

$$\text{Horsepower} = (500/600)^3 \times 0.32 = 0.185 \text{ bhp}$$

Most manufacturers' fan data is based on so-called standard air which, by definition, is air having a density of 0.075 lb per cu ft. This is substantially equivalent to dry air at a 29.92 in. Hg barometer and 70 F. If the air to be handled by a fan has a density or barometric pressure much different from standard, manufacturers' data can be corrected in accordance with the fourth fan law given above. Air density is, of course, the reciprocal of the specific volume, as can be read from any psychrometric chart.

Selecting Fans for a Given Duct System

Before a fan can be selected, we must know something about the duct system to which it is to be applied. We usually start out by determining the cfm needed and then design a duct system which will have a certain resistance to air flow at the required cfm. Knowing one point of cfm and resistance pressure we can construct a system resistance curve by using the relationship

$$r = k\ (cfm)^2$$

where

r = resistance pressure of system, in. water gage

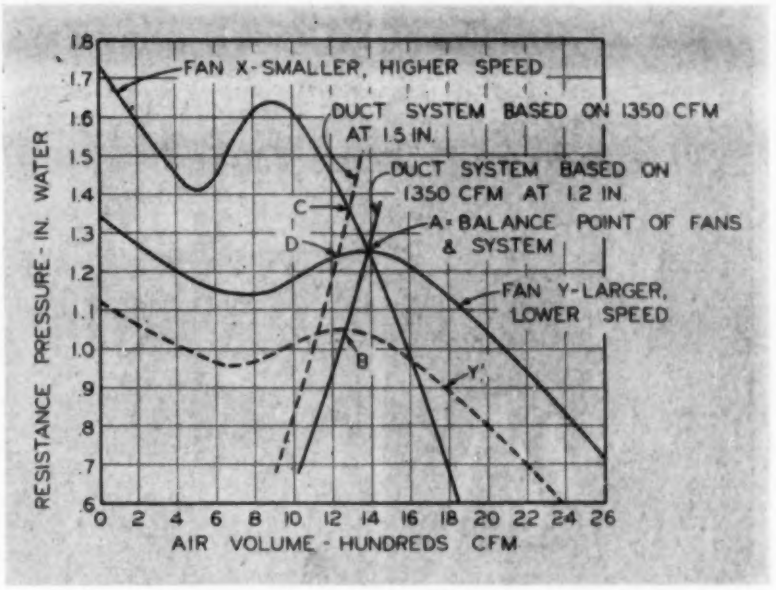


FIG. 5 — TO SOLVE a fan selection problem, the pressure characteristics of two fans are plotted across the system characteristic curve

cfm = cubic feet of air per minute

k = a constant (0.00000066)

Suppose, for instance, we desire to circulate 1350 cfm through a duct system and have calculated the resistance pressure to be 1.2 in. for this delivery. Using the equation above we can calculate several points for our system curve as follows:

cfm	*r*
1450	1.38
1350	1.20 (design point)
1250	1.03
1150	0.872
1050	0.725

These figures were used to plot the system characteristic curve shown on Fig. 5.

The next problem is one of selecting a fan. From a manufacturer's catalog data we select two fans each of which will handle 1390 cfm at 1.25 in. resistance pressure. Since this is close to our design point of 1350 cfm and 1.20 in. resistance pressure, we plot the pressure characteristic of each of these fans across our system line on Fig. 5. It will be noted that the fan lines cross the system line at point *A*.

Several interesting things can be noted from Fig. 4. Fan *X* is smaller than fan *Y* and therefore requires a higher speed than *Y* to deliver a given amount of air. Fan *X* balances the system curve some distance to the right of its peak pressure, whereas fan *Y* balances quite near the peak. Fig. 4 shows that the point of highest efficiency is close to the point of highest pressure for this type fan. It can be assumed, therefore, that fan *Y* will be operating in a much more efficient zone requiring less horsepower than fan *X*. It can also be assumed that fan *Y* will be quieter due to its lower speed.

If the speed of fan *Y* is reduced, the fan will operate as shown by a new curve, *Y'*, which will cross the system curve at point *B*. Notice particularly that points *A* and *B* occupy the same relative position on both curves *Y* and *Y'*. No matter what the fan speed, the fan curve will always cross the system curve at the same relative position on the fan curve.

When System Resistance is Miscalculated —

We have shown above the difference in characteristics between a small, high speed fan and a larger, slower speed fan both applied to the same duct system. We have also shown the effect of a speed change on system balance. Let us now examine the effect of a miscalculation of the duct system resistance.

The amount of deviation between

(*Please turn to page* 127)

A DIFFUSER is installed on an unfinished ceiling (*left*). The prefabricated circular duct shown between the joists permits the attic to be floored over. The completed diffuser installation (*right*) calls for a return air grille under the window

Selecting, Installing Ceiling Diffusers

. . . for a residence in Danbury, Conn. The overhead heating system described here is adaptable for summer cooling

James Buchanan and Norton Bradley
Hendrichs Heating Co.

CEILING DIFFUSERS have been used for a number of years for heating commercial and industrial buildings. There are hundreds of thousands of these installations, for both heating and cooling, in stores, offices, restaurants, theaters and factories.

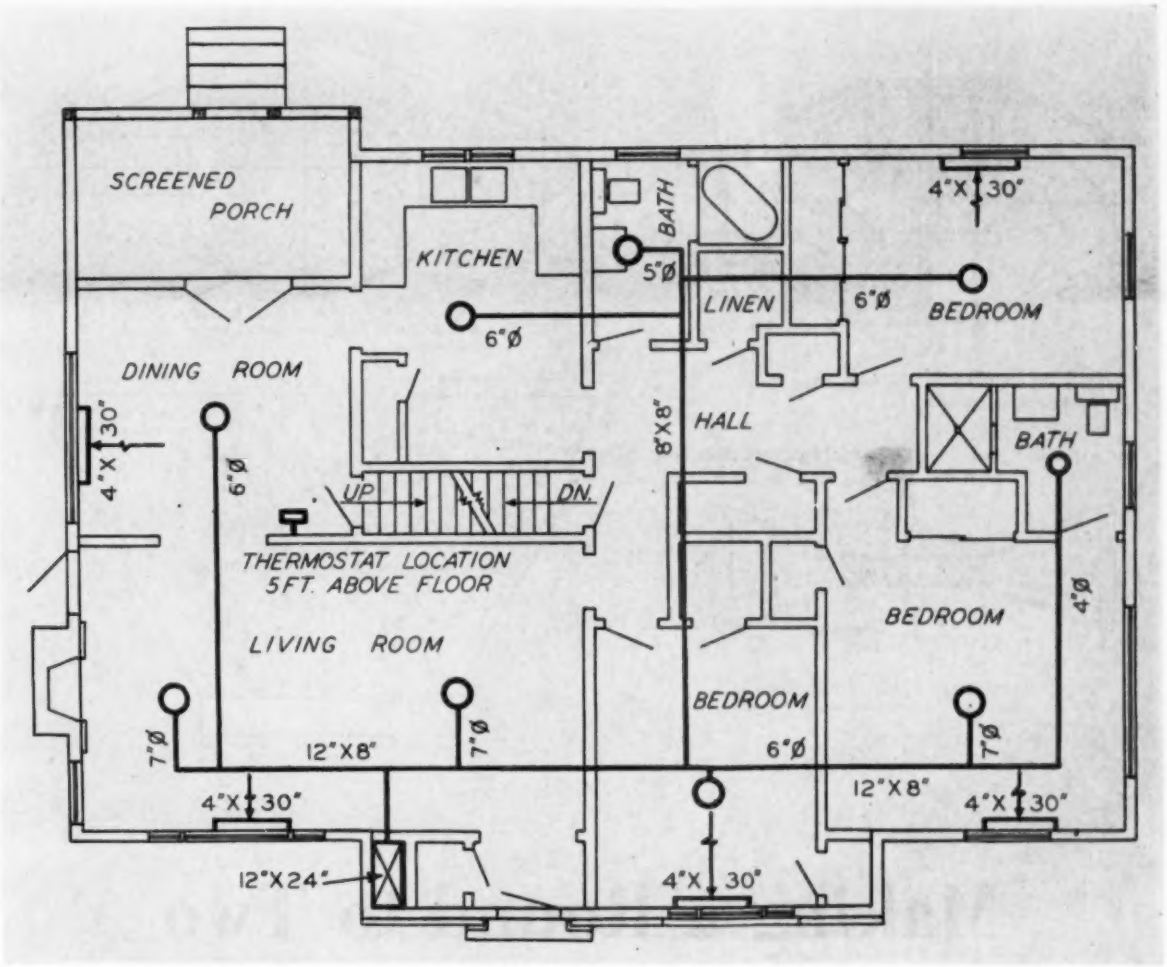
Specially designed diffusers are available for the home, and these units are used in residential work because they can deliver premium heating with economy. They also offer home owners freedom in furniture placement, and decorative advantages (they can be combined with lighting fixtures in kitchens, bedrooms and other rooms).

In one particular case in our experience, the owner had specified a system which could be used for future cooling. The overhead heating system we installed can meet this specification, as can systems using high sidewall grilles. Both ceiling diffusers and these grilles are used extensively in the many year 'round air conditioning jobs now installed in this country which discharge air above the heads of the occupants.

Aim at Comfort and Economy

The installed cost of the overhead diffuser system shown in the floor plan was but $1050, complete with furnace. The reasons for the economy achieved were: (1) the reduced labor cost brought about by the ease of laying the duct on the attic floor; (2) the use of prefabricated round duct for all diffuser branches; and (3) reduction in the amount of ductwork needed, including elimination of all the vertical stackheads and fittings which would otherwise have been required.

The system we installed was designed to afford the customer air at proper temperatures within the "sitting zone." In systems like this, the supply air is mixed with the room air outside of the sitting zone, above the heads



THE SUPPLY and return air layout of the ceiling diffuser installation in Danbury, Conn., is shown here

of the occupants. When the air comes down into the occupied zone, therefore, it is already mixed and at the temperature called for by the thermostat.

It was also our aim to assure that air would be mixed instantaneously and prevent stratification. The diffuser we selected takes the warm supply air, ejects it into the room, mixes it rapidly with the room air, and does not give the warm air any opportunity to collect on the ceiling.

We felt the fast mixing action of the diffuser, plus the pull-down effect of the return air grilles, would result in a total temperature difference from floor to ceiling of only 2 to 3 deg, as would be true of most ceiling diffuser systems in a reasonably well constructed residence like the one shown.

How Duct System Was Laid Out

The supply and return air layout of this ceiling diffuser installation in Danbury, Conn., is illustrated in the floor plan.

The total heat loss from the house was calculated at 77,000 Btu per hr. To provide for future attic expansion, we selected a furnace with a rating at the bonnet of 141,000 Btu per hr and a rating at the outlets of 120,000 Btu per hr.

How Diffuser Sizes Were Picked

After calculating the heat loss from each room, we picked the diffuser sizes from the selection table shown below. The diffusers we used operate at an average of

(*Please turn to page* 128)

Selection Table for Warm Air Heating

Diffuser Size	Btu Range	Dia. Round Branch Pipe	Equivalent Stand. Rect. Branch Duct	cfm Range
4 in.	3000- 4300	4 in.	4 x 8 in.	35- 50
5 in.	4300- 7000	5 in.	4 x 8 in.	50- 80
6 in.	7000- 9500	6 in.	4 x 8 in.	80-110
7 in.	9500-13000	7 in.	5 x 8 in.	110-150
8 in.	13000-18000	8 in.	7 x 8 in.	150-210
9 in.	18000-23000	9 in.	8 x 8 in.	210-270

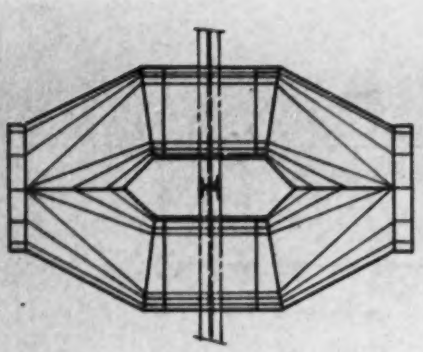


FIG. 1—PLAN VIEW of duct being split to pass around building obstruction

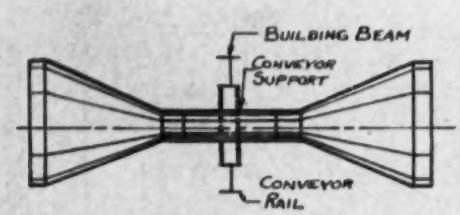


FIG. 2—ELEVATION VIEW of duct shown in Fig. 1. Note the reduction necessary for rail clearance

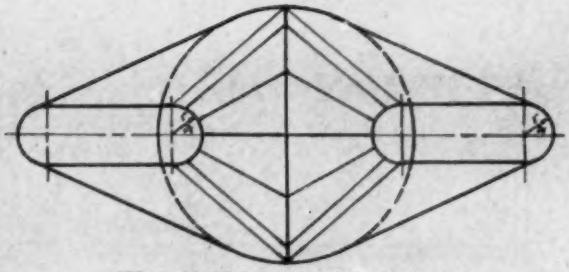


FIG. 3—PLAN VIEW of the Y branch that forms the transition fitting for both ends of the split duct system

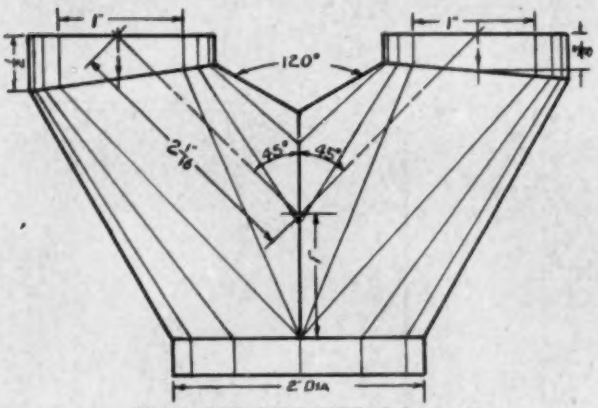


FIG. 4—ELEVATION VIEW of the transition fittings

Making a Round to Two Ovals Y Branch

In this fitting layout, two Y transitions form a collar to go around a building obstruction, solving a problem often encountered in sheet metal work

Hugh B. Reid

Instructor, Sheet Metal Pattern Drawing

THE FIELD condition which necessitated the design of the fitting described here is shown on Fig. 2. The problem which confronted the design draftsman is familiar. A ventilating duct system had been designed for an industrial building and the lack of coordination between the various trades had resulted in a conveyor support channel being installed in the path of the main duct line. The duct had to be re-routed to fit between the building beam and the conveyor mono-rail and to straddle the supporting channel. The round to ovals Y branch proved the most practical solution to the problem.

In designing the fitting, the draftsman has to consider pipe areas. For example, assume that the designed diamter of the existing pipe is 10 in. The area of a 10 in. diameter pipe is 1257 sq in.; 1257 divided by 2 equals

(*Please turn to page* 133)

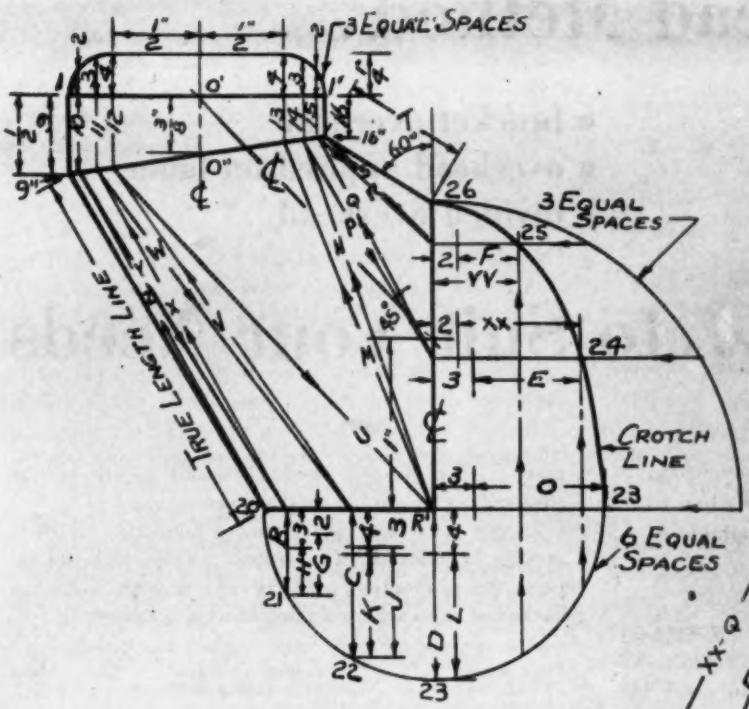


FIG. 5—SIMPLIFIED METHOD used to lay out the pattern

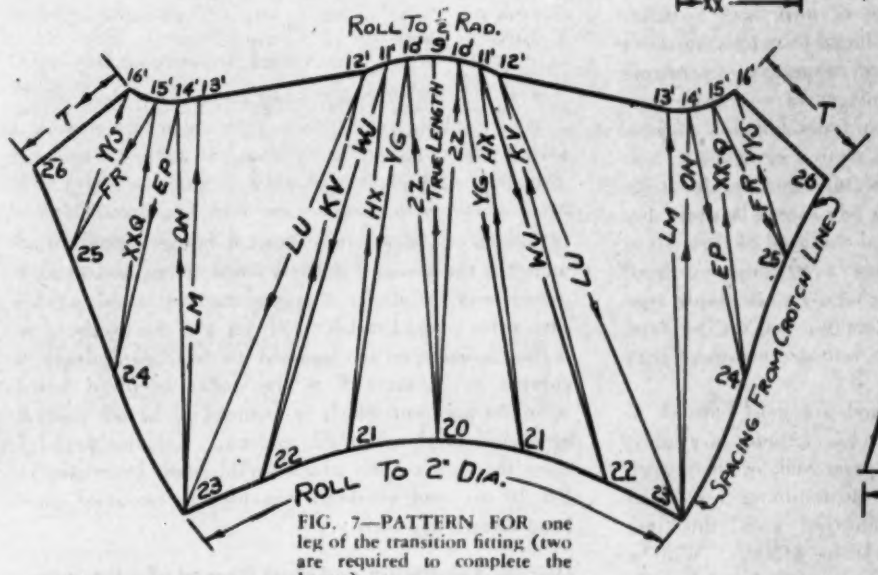


FIG. 7—PATTERN FOR one leg of the transition fitting (two are required to complete the layout)

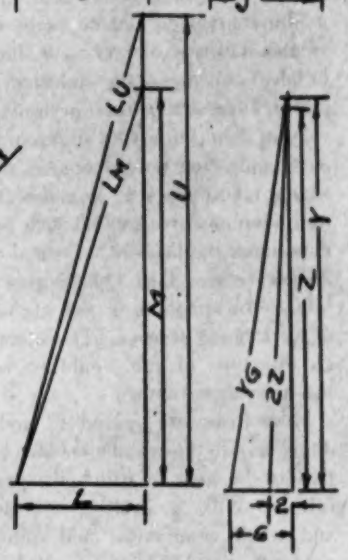


FIG. 8—TRUE LENGTH lines used to develop Figs. 5 and 7

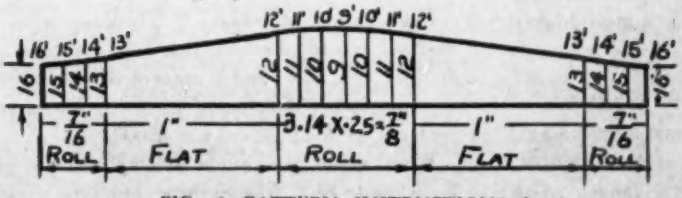


FIG. 6—PATTERN INSTRUCTIONS for forming the miter and collar (two are required to complete the layout)

Vary Overhead Method...

- **bracket overhead**
- **overhead applied on labor**
- **divided overhead**

...to Suit Your Needs

To insure against taking unprofitable work, the contractor should know how and when to use the various types of overhead available to him

THE HEATING and sheet metal man has at his disposal numerous methods for figuring overhead. Which he should use depends on various factors. In many instances, for example, using the job or bracket overhead method is the best way to assure profitable work.

Many firms do a wide range of work both in dollar volume and type of jobs. It should be readily apparent to any student of the industry or of the construction industry generally that percentages of overhead must vary in connection with different types and sizes of jobs. Any contractor having done a church or cathedral job which takes years to complete and innumerable trips to the job must realize that such jobs cannot be profitably done upon the basis of a normal overhead of from 16 to 25 per cent. Such jobs impose a very high overhead rate. Information is not at hand covering this type of work but it seems a fair assumption that the overhead on this type of job would be considerably more than the normal percentage.

Most firms are geared to and are most efficient in doing certain types and sizes of jobs. Almost invariably, that is the area in which the great bulk of their work falls. With a heating contractor doing residential and small commercial and industrial work, this area probably would be from $500 to $1500. With a contractor doing large commercial and industrial work, the area of greatest efficiency would fall in a much higher bracket.

Work in Proper Bracket Means Lower Costs

If a firm could do all its work in this marginal bracket, its overhead would be much lower than is the case when work is taken over a wide price and type range. For instance, suppose a firm was most efficient in doing jobs of from $25,000 to $50,000. What would its proper overhead be for a job of less than $50 in direct job cost? The proper overhead would surely be far greater than the normal overhead percentage.

In this connection, the following tabulation which is entirely hypothetical, is presented. This will better express the proposition in detail and perhaps suggest a method of approach for finding bracket overhead.

Price Range	Volume	Overhead %	True Dollar Overhead	20% Dollar Overhead	Gain	Loss
	1	2	3	4	5	6	7
1. $2000 & up	6000	24	1440	1200		240
2. 1500-2000	8000	20	1600	1600		
3. 1000-1500	60,000	16	9600	12,000	2400	
4. 750-1000	30,000	18	5400	6000	600	
5. 500- 750	20,000	22	4400	4000		400
6. 250- 500	8000	28	2240	1600		640
7. 100- 250	6000	36	2160	1200		960
8. Under 100	2000	58	1160	400		760
TOTALS	140,000		28,000	28,000	3000	3000

Column 1 covers the bracket price range. Column 2 is the assumed dollar volume of business in each price range. Column 3 is the assumed overhead for each price range bracket. Column 4 is the overhead in dollars based upon the assumed overhead percentages in column 3. Column 5 is the dollar overhead based upon 20 per cent which is assumed to be the general or overall overhead of this concern. Columns 6 and 7 show the gain or loss which would result from using a flat 20 per cent overhead, provided the assumed overhead figures are correct.

Discuss Tabulation as Actual Record of a Business

Examination of column 2, assuming it as an actual business record, discloses that business done in brackets or lines 1, 5, 6, 7, and 8 amounted to $42,000 and that the loss incurred through using too low overhead percentages on this business was $3000.

What about the other $98,000 shown in brackets 2, 3, and 4? These three brackets show that the contractor broke even in his overhead calculation on bracket 2, made $2400 more than he figured in bracket 3 and made an additional $600 in bracket 4.

In reality this contractor could and should have avoided the necessity of doing $42,000 of work, which is a huge task, and still have made $3000 more than he did.

Volume without profit is something that a good business man avoids like a plague. The intent of this discussion is to point up the fact that many contractors are doing a large volume of work for which they actually pay out much more than they take in. It behooves every qualified contractor to carefully examine all angles of his business and make doubly sure that he is not paying out actual dollars for the doubtful privilege of doing a lot of unnecessary volume.

The further idea to stress is that if this imaginary contractor had found exactly what the overheads were in the several brackets and applied these overheads in accordance with the sizes and types of jobs, he would have had a tremendous competitive advantage in brackets 3 and 4 of at least 4 per cent and 2 per cent, respectively, or perhaps even more. In the other brackets, he would have either taken the work upon a basis which would have been profitable or would have avoided doing it.

The tabulation, as stated, is an assumption. No claims are made that it is factual. The only claim is that the overheads are different in the different brackets of business in every shop doing a wide range of work in dollar volume.

Overhead Applied on Labor

Previously the desirability was stressed of having a monthly statement with each item or groups of items of expense worked out in terms of percentages of sales. If this is the practice, the application of overhead on labor is a simple problem. In fact, applying both the overhead and profit upon labor can be accomplished with a single simple calculation.

Let's assume that percentages to sales of a business are:

Material & equipment purchased		40%
Direct job labor		30%
Total direct job cost		70%
Overhead to sales	20%	
Profit desired	10%	
Total overhead & profit		30%
Selling price		100%

To determine a selling price, since the combined percentages of overhead and profit are exactly the same as the percentage of labor to sales, all that is necessary after the direct job costs have been estimated is to double the labor and add the estimated material and any other direct job costs to this amount. The result is the selling price.

Should the several percentages not be so accommodating as to provide for this extremely simple method, the procedure would be as follows, assuming the following direct job cost percentages:

Material		39%
Labor		32%
Overhead	19%	
Profit rate desired	10%	
Total overhead and profit		29%
Selling price		100%

First find what percentage the 29 per cent of combined overhead and profit represents to the 32 per cent for labor.

$$29/32 = 90.6\% +$$

Let's assume that the direct job labor cost as estimated is $3200, to which must be added 90.6 per cent of itself, or $2900, which totals $6100. The estimated material amounts to $3900, and selling price is $10,000.

Of course, any firm can indulge in the fiction of adding something to material for cutting and handling but if records reflect truly every transaction regardless of the amount and if they reflect percentages similar to the above, the method will avoid much unnecessary trouble in finding a selling price. Under the above conditions, this procedure will be as accurate as any other method. Of course for OPS requirements, the contractor has to show what part of the 90.6 per cent markup on labor was for profit and what part was for overhead.

Formula Solves Special Problem

Basing your combined overhead and profit upon labor alone does present a problem sometimes when it comes to time and material work, as well as OPS requirements. Here is one formula or method for handling the problem.

In this case it was intended to add 5 per cent to the cost of material for handling and 11 per cent for profit or a total of 16 per cent. The balance of the overhead and profit was to be added to the direct labor cost. Using the same percentage figures of material 39 per cent, direct job labor 32 per cent, profit 10 per cent and overhead 19 per cent, the following tabulated formula would apply:

	Percentages to be added	Percentages of Sales Price	
SELLING PRICE			100%
MATERIAL		39%	
Handling charge added to material	5%	1.95	
Profit added to material	11%	4.29	
Total to be added to material	16%	Total	45.24%
Leaving for overhead and profit			54.76
LABOR		32%	
Overhead	54%	17.28%	
Profit	18%	5.76%	
Excess percentage from using whole numbers			.28%
Total to be added to labor	72%	Totals 55.04	55.04

To find the selling price with these figures and using

(Please turn to page 140)

Novel Sidewalk Display Brings in Business

. . . for a sheet metal shop, which also uses direct mailings and other promotional devices to boost sales

Robert F. Welch

BUSINESS DOESN'T simply flow into a sheet metal shop like water running down a hill. It has to be drawn in.

Recognition of this elementary truth is largely responsible for the growth of Aladdin Sheet Metal Co. in Hawthorne, Calif. The firm was launched two years ago with a total investment of about $15,000. Today there's more than $55,000 tied up in the shop equipment alone, and a crew of 30 employees is kept constantly busy on a wide variety of work. Expansion like that doesn't just happen — it's planned and prepared for. Partners James Purpus and Louis Cohen aren't overlooking any possible avenues of bringing in new business.

One promotional device which has proved to be a very good investment has been to mount several samples of sheet metal products on a corrugated fence along the sidewalk next to the shop. These were put up at nominal cost, utilizing stock on hand. During the first four weeks in which the material was on display, an average of three inquiries a day was received.

As is frequently the case, people driving down the street didn't realize that the sheet metal shop could fill their needs until they received a visual reminder. Three gutter jobs were sold during the first month. Sometimes people will stop to say they want one of "those," pointing to a canopy or louver which they needed but didn't know how to get.

Another effective means of attracting new accounts, the partners have found, is a direct mail advertising campaign which Mr. Purpus devised to give the firm

(*Please turn to page* 118)

ANOTHER CASE OF *Copper* WHERE IT COUNTS

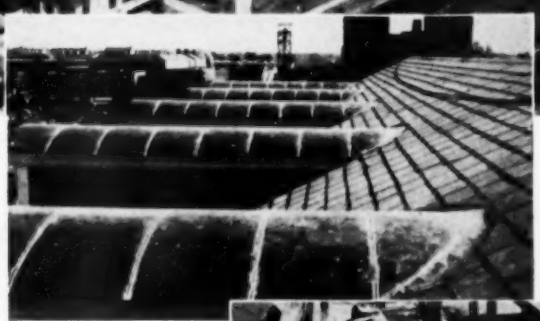
"Building to endure," invariably means, "Building with copper." Not only does copper endure for scores and scores of years, but it needs practically no maintenance while turning in its marathon performance. That's why architects and builders prefer to specify it.

Sheet metal contractors like it because it is so readily worked and soldered. And when installed as recommended in Revere's booklet, "Copper and Common Sense," customer satisfaction is assured and the prestige and reputation of all concerned are protected.

Such was the case of the buildings which comprise the Theological Quadrangle at Southern Methodist University. The gutters were made of 24 oz. Revere Sheet Copper, each section being made from three 8-ft. lengths, riveted and soldered together with 24 ft. between expansion joints.

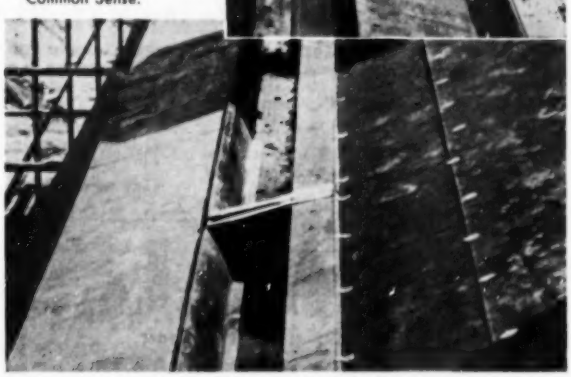
Now, with restrictions eased, and quantities permissible without allotments greatly increased, there isn't any reason why your next job can't have the many benefits of Revere Copper. See the Revere Distributor nearest you about Revere Sheet, Strip or Roll Copper for flashing. Particularly ask him about the money-saving advantages of Revere Keystone Thru-Wall Flashing.* And, if you have technical problems, he will put you in touch with Revere's Technical Advisory Service.

*Patented



LASTING, NON-RUSTING REVERE 16-OZ. COPPER covers the dormer roofs of the buildings in the Theological Quadrangle of Southern Methodist University.

NOTE WORKMEN—putting prefabricated 24-oz. Revere Copper Gutter sections into place. Installation was made in accordance with Revere's recommendations in the booklet, "Copper and Common Sense."



CLOSE-UP OF EXPANSION JOINT before capping. Joints were placed 24 ft. apart. The facia copper leading from the upper, outer edge of the gutter over the masonry cornice, was 16 oz. Revere Lead Coated Copper. 68,000 lbs. of Revere Copper was used on the entire Quadrangle project of 7 buildings. Architect—Mark Lemmon. Gen. Cont.—Henger Construction Co. Sheet metal contractor—American Sheet Metal Co. Revere Copper furnished by Moncrief-Lenoir Mfg. Co., all of Dallas, Texas.

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The MAYFAIR

Summer AIR CONDITIONER

by AMERICAN-Standard

THE Mayfair is a cooling unit for small to medium-size homes. Featuring a hermetically sealed cooling system—tested and sealed at the factory—it is as dependable and simple in operation as a modern refrigerator. Thermostatic control automatically assures cool comfort in hot weather. Mechanically cooled and dehumidified air circulates throughout the house.

The Mayfair Summer Air Conditioner is designed for easy connection to the ductwork of existing forced warm air heating systems. When installed with the Mohawk or Seneca Winter Air Conditioner, or other American-Standard units, it provides complete year 'round air conditioning at its best.

Your wholesale distributor will tell you more about the Mayfair and the sales aids available to help you get your share of the profitable residential cooling business.

These features make the MAYFAIR today's most efficient, economical unit

HERMETICALLY SEALED REFRIGERATION SYSTEM—Two 1-horsepower refrigerant circuits are completely sealed at the factory. They are as dependable in operation as a modern refrigerator. Covered by a 5-year warranty.

MORE EFFICIENT REFRIGERANT—The use of Freon-22 contributes to the lower operating cost of the Mayfair.

STEP STARTING RELAY—Intermediate relay starts one compressor at a time to reduce current for starting.

STEP OPERATION—The use of two refrigerant circuits permits flexible capacity control. This exclusive control system permits cutting out circuits automatically when less cooling is desired.

EASY INSTALLATION—The Mayfair is a compact unit, shipped ready for simple connection to existing ductwork, and water and electrical services.

QUIET OPERATION—Built-in compressor mufflers, cushion mounting of all moving parts, and internal canvas connections assure quiet operation.

SIMPLIFIED SERVICE—A refrigeration service man is not required as hermetically sealed circuits are easily and quickly replaced should defects occur.

American Radiator & Standard Sanitary Corporation
P. O. Box 1226, Pittsburgh 30, Pa.

MAGNE-FILTER
Electronic
AIR CLEANER

The Magne-filter is a dry type electrostatic air filter that effectively removes dust, dirt, smoke, pollen and airborne bacteria from the air by electrical attraction. Can be quickly installed in the return air duct of any forced warm air heating or cooling system. No water connection required.

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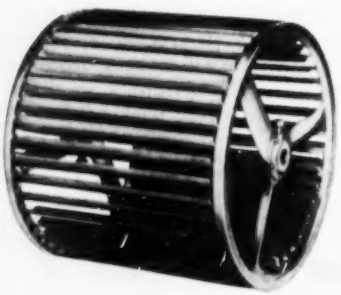

BLOWER PARTS AND ENGINEERING SERVICE FURNISHED—WRITE MORRISON PRODUCTS, INC.

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NEW OFFICERS *(at left)* elected at the Indiana convention are: *(seated, l. to r.)* Homer Selch, H. M. Daily, T. B. Speaker, F. E. Anderson; *(standing, l. to r.)* W. E. Garber, Jr., F. E. Stewart, R. A. Harris, Don McCloskey, H. G. Boyd, and V. H. Hazelton. Checking the schedule of the convention program *(right)* are president Merle Daily and convention chairman Don McCloskey *(l. to r.)*

Contractors Talk About

- **Selling**
- **Perimeter Heating**
- **Summer Cooling**

. . . at the annual convention of the Sheet Metal and Warm Air Heating Contractors' Association of Indiana

THERE EXISTS today among sheet metal contractors and warm air heating dealers a general feeling that the year 1953 will be just as big a year as 1952, but that work will not come to the contractor as easily as it has in the past. He will have to go out after it. He must develop a sales plan and a business control plan if he wishes to make satisfactory profits this year. These facts were brought out at the annual convention of the Sheet Metal and Warm Air Heating Contractors' Association of Indiana — the largest turnout in the association's history. The convention was held February 5 and 6 at Indianapolis.

The books of one sheet metal contractor who did an annual business volume of $800,000 in 1952 showed a loss of $6000 when they were balanced at the close of the year. This is one of the things that indicate com-

THE LADIES talk it over too *(above)*, but the subject hasn't anything to do with sheet metal. Chatting are *(l. to r.)* Mrs. Ted Kolbus, Mrs. John Madden, and Mrs. Harry Whitaker, all of Indianapolis. Dancing to the tune of "Home in Indiana" *(at left)* are Mr. and Mrs. Harold Austin of Kalamazoo *(left)* and Mr. and Mrs. R. D. Boussum of Fort Wayne

petition is becoming more intensified and that contractors need to look more closely at their business policies, according to J. D. Wilder, secretary of the Sheet Metal Contractors National Association. Mr. Wilder believes that experiences during past years, when selling a job consisted mainly of taking an order, have caused many businessmen to overlook some of the important lessons they learned when business policies had to be watched more closely. He believes that businessmen need "to go back to school" for a few days each year to review the subjects essential to conducting a business today.

Mr. Wilder pointed out that the Sheet Metal Contractors National Association has worked for a long time, through its business administration committee, to obtain reliable data that can be applied to business administration and help reduce overhead. The results are periodically sent to members of the national association. He suggested that every contractor take steps to obtain any reliable information on the subject of business administration and compare this with the policies he is now following.

He also recommended that the contractor think more about how to build prestige within his locality. One way suggested was to obtain copies of the two codes that have been prepared by the national association — which are available to members and non-members — and to call on architects, becoming better acquainted with them and leaving these code pamphlets. One way to make a good impression on this type of professional man is to let him know that you want to see the best type of installations made and that you will gladly offer suggestions on any problem that relates to the sheet metal field. The two codes are *Code of Trade Practice for Ventilating and Air Conditioning* and *Code of Trade Practice for General Sheet Metal Work.*

Mr. Wilder further warned the contractors that some general contractors are trying to install as much of the material going into a building as they can with their own crews of laborers. However, all of the sheet metal work should be let out for subcontracting to the sheet metal contractor. The practice of limiting the quantity of work to subcontractors is being brought to the attention of government officials in Washington who have prepared a bill that will recognize the subcontractor's rights in construction work and will help immeasurably in cutting down on another bad practice followed by some general contractors — bid shopping.

Perimeter Heating an Unlimited Field

The development of perimeter heating was outlined by W. D. Redrup, president of the National Warm Air Heating and Air Conditioning Association. He described experiments in this field at the University of Illinois and the results of mobile field laboratory work.

The manuals used in the association's two day comfort conferences are periodically revised to keep the classes up-to-date, he said. The latest revisions are in manuals 4, 7, and 10. A new manual, No. 11, is being assembled and will be ready soon. It will cover summer cooling and how it is adapted to an existing warm air heating system and to new residential installations.

In pointing out how Manual 10 should be used for a perimeter heating system, Mr. Redrup emphasized the importance of following to the letter the instructions given. From a table in this manual, he quoted the number of Btu delivered to a room from a 50 ft run using six elbows as 2900 Btu per hr, whereas a 5 ft run using two elbows would provide 8800 Btu at the outlet. He then explained that supplying the correct Btu to a room required enough individual runs to obtain the correct Btu input to equal the calculated heat loss under design conditions.

He went on to say that the use of the small round duct had permitted the installation of warm air furnaces in many homes which would otherwise have been heated by

(Please turn to page 139)

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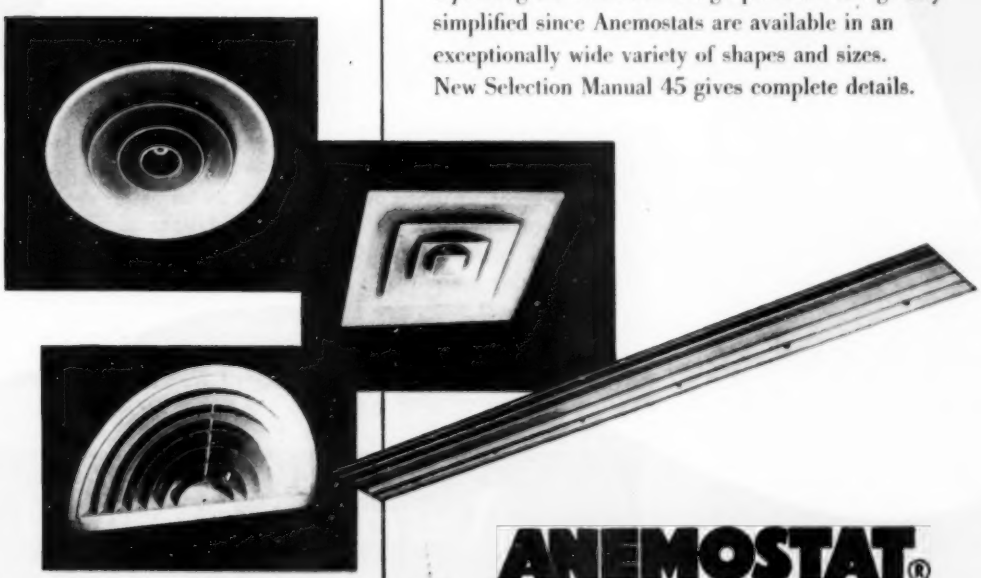

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for basement installations
IN 4 SIZES
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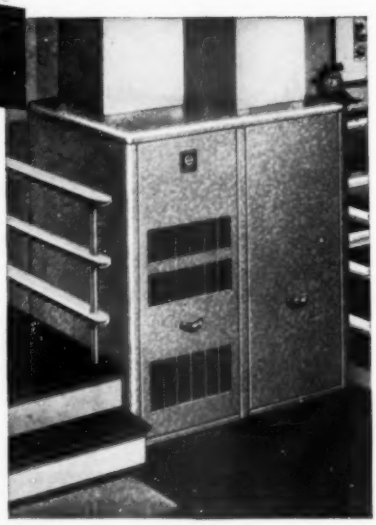

■ For carefree heating comfort, this fully automatic winter air conditioner is second to none. The heating element is corrosion-resistant copper bearing steel welded into an integral unit. Correctly placed baffles divert hot gases to sides of elements, heating entire element uniformly. Individual controls are the finest available. Burners are cast iron with patented high temperature alloy ribbons. Manifold piping and controls are sub-assembled. Burns natural, mixed, manufactured, liquefied petroleum, or LP-air gas.

The WYANDOTTE
for utility room installation
IN 5 SIZES
ranging from 55,000 to 125,000 Btu input per hour

Featuring the same fine engineering and workmanship as the Seneca, the Wyandotte occupies minimum space for installation in utility rooms, alcoves, closets or other out-of-the-way locations on the first floor, or in small basements. Safe, efficient, smart in appearance, the Wyandotte can be installed on combustible floors. The Wyandotte is shipped completely assembled and pre-wired, burns natural, mixed, manufactured, liquefied petroleum, or LP-air gas. For more detailed information, contact your wholesale distributor.

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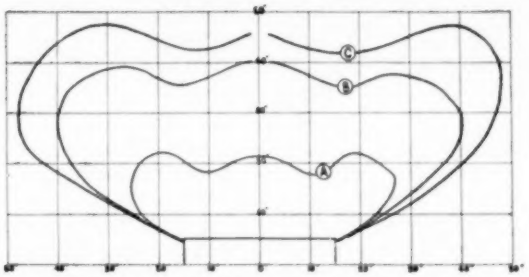
ENGINEERING DATA ON PERFORMANCE OF NEW TITUS PERIMETER DIFFUSER

FOR HEATING AND COOLING. Delivers air where it is most needed. Requires one-half labor and one-half duct work of ordinary installations. Fits any type warm or cool air installation. Need not be confined to perimeter jobs. Guaranteed quality. ELIMINATES FLOOR DRAFT AND COLD OUTSIDE WALLS. Makes home warmer in winter, cooler in summer.

ISO-VEL SHOWING AIR PATTERN OF TITUS NO. 100 PERIMETER DIFFUSER

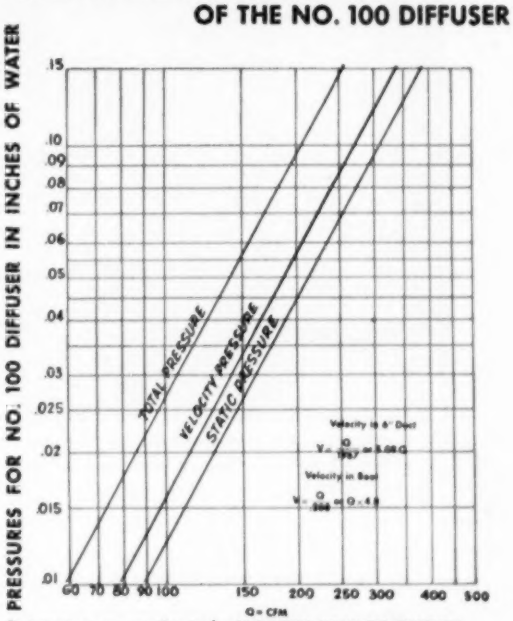


Pattern spread is important where higher diffuser velocities are used. Note how this diffuser gives an additional blanketing of the outside wall. The above iso-vels were taken at (A) 130 CFM; (B) 180 CFM; (C) 230 CFM. The patterns indicate all points at which a 200 FPM velocity reading occurred.

ENGINEERING DATA FOR TITUS NO. 100 PERIMETER DIFFUSER

CFM	Static Press. in in. of H_2O	Velocity Press. in in. of H_2O	Total Press. in in. of H_2O	Throat Velocity in FPM	Register Temperature 135° Btu per hr.	140° Btu per hr.	146° Btu per hr.
90	.0100	.0120	.0220	432	6000	6400	6900
95	.0110	.013	.0240	456	6300	6800	7300
100	.0120	.0145	.0265	480	6700	7100	7700
105	.0133	.0160	.0293	504	7000	7500	8100
110	.0145	.0170	.0315	529	7300	7850	8450
115	.0160	.0190	.0350	552	7700	8200	8850
120	.0172	.021	.0380	576	8000	8600	9200
125	.0185	.023	.0415	600	8300	8900	9600
130	.0200	.0250	.0450	625	8700	9300	10000
135	.0215	.0265	.0480	649	9000	9650	10400
140	.0235	.0290	.0525	672	9350	10000	10800
145	.025	.0300	.0550	696	9650	10350	11150
150	.0265	.0315	.0580	721	10000	10700	11500
155	.0270	.0350	.0620	745	10300	11060	11900
160	.0300	.0370	.0670	769	10650	11400	12300
165	.0310	.0395	.0706	792	11000	11800	12700
170	.0340	.0420	.0760	816	11300	12150	13100
175	.036	.044	.0800	840	11700	12500	13450
180	.038	.046	.0840	865	12000	12900	13850

CFM AND PRESSURE REQUIREMENTS OF THE NO. 100 DIFFUSER



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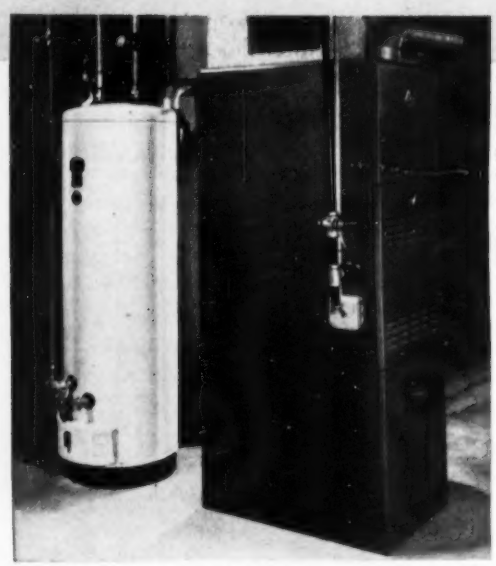
exclusive with the A.O.Smith WINTER AIR CONDITIONER



High-Boy Model A. O. Smith Winter Air Conditioner as installed with well-known Permaglas Automatic Water Heater. Low-Boy and High-Boy Models are approved by AGA for modulation of gas input from 40,000 to 100,000 BTU/hr.

with the **Flame** that **Tunes Itself**

Here is a furnace with a modulating burner that automatically and constantly replaces heat loss at the exact rate of loss! No more on and off burner cycles . . . no more up and down room temperatures.

The burner flame of the A. O. Smith Winter Air Conditioner tunes itself *continuously* to changing heating needs . . . the furnace adjusts itself to the slightest weather change. It "thinks for the thermostat"!

Living-level heating . . . the CONTINUOUS COMFORT assured by A. O. Smith winter air conditioners . . . is made possible by:

1. Exclusive *Magic Heat Control* which continuously measures the rate of heat loss and automatically adjusts gas input to the . . .
2. Exclusive *Modu-flame Burner* which provides the precise amount of heat required, and the . . .
3. Exclusive *Duo-Level Blower Control* which automatically varies the velocity of constantly circulating filtered air in accordance with the heat output.

In this way indoor comfort is kept uniform, constant, regardless of outdoor temperature fluctuations.

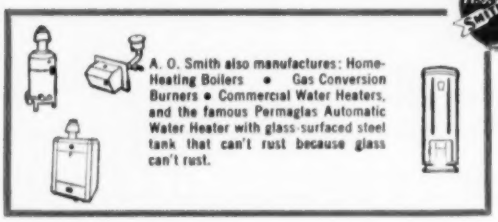
For complete information write A. O. Smith Corporation, Permaglas-Heating Division, Dept. AA353, Kankakee, Illinois.

Nothing else like it on the market!

LIVING-LEVEL HEATING MEANS

More **than automatic heat!**
More **than continuous air circulation!**
More **than mechanical burner control!**
More **than electronic temperature control!**

. . . It Means CONTINUOUS COMFORT!



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Supplying Cooling Equipment Is Job for Heating Wholesalers

At their recent convention, heating wholesalers were given valuable pointers on how to select, stock and handle cooling equipment, and how to help in training dealers to merchandise and service it

HOW THE HEATING wholesaler should plan to supply summer cooling equipment to dealers was the theme of the annual convention of the National Heating Wholesalers Association held in Chicago, January 29-30. The wholesalers were told where cooling would fit into the heating picture, how to stock and handle the equipment and how to help train dealers to merchandise this equipment. Several of the speakers have been closely associated with the residential cooling field since it was first recognized as a new approach to modernizing old homes and as a way to keep the home building level high.

John L. Roth, York Corp., pointed out that manufacturers need wholesalers who are already accustomed to dealing with the installer of heating equipment. He explained that the addition of an engineer to the wholesaler's staff to handle the application problems would be the only extra personnel needed to round out a program that is now serving the heating industry so well.

"Contrary to most opinions," Mr. Roth stated, "there is no rule of thumb to estimate either the original cost or operating costs for residential cooling. The area, shape, sun exposure, and many other factors enter into the selection of the correct size equipment; that is why manufacturers offer 2, 3, and 5 ton (and other) capacity units. The operating costs must be based upon geographical location, building construction, and local charges for water and electricity. Generally, these costs will range from $20 to $50 per ton per season.

"Wholesalers will need to familiarize themselves with new repair parts such as expansion valves, liquid dehydrators, filters, condensing units, water valves, and controls. The dealer is going to rely upon the wholesaler for technical advice and recommendations to serve the market of 39,000,000 old homes and 5,000,000 postwar homes which have not yet been air conditioned.

Research in Cooling Provides Valuable Data

Speaking from the manufacturer's point of view, G. W. Denges, The Williamson Heater Co., told the wholesalers about the research that has been conducted by the furnace manufacturers to ascertain the market for cooling equipment. Their investigations revealed that over 90 per cent of the people in the United States live in sections where cooling would add to their comfort. Mr. Denges stated, "I believe this market can eventually be as large or even larger than heating if it is properly developed. Having established that there does exist a good potential market, our next step is research and development. In the field of research, I feel our industry should give recognition to the work which has been done by the National Warm Air Heating and Air Conditioning Association, both at the University of Illinois and in the field.

Mr. Denges mentioned a bulletin recently issued by the association outlining the results of the cooling tests conducted this past summer in the Research Residence at the University of Illinois. Results show that use of units smaller than required for the peak load conditions, which are permitted to run longer, contribute greatly to reducing initial installation costs and, to some extent, operating costs.

"With this basic information, a manufacturer must then develop his own product," he said, and went on to describe a combination heating and cooling perimeter system in a small office building.

The system consists of four separate zones, each with a gas fired forced air furnace and a cooling coil installed in the return air side of the unit. All of the ducts supplying both warm and cooled air are imbedded in concrete under the floor and run along the outside walls of the building. The air is discharged under the windows at a height of 4 ft 6 in. from the floor through registers with directional control. "From this installation we have gathered valuable information to help guide us in the development of cooling products," he said.

Units Should Meet Various Specifications

Mr. Denges then outlined a number of specifications which a good cooling unit should meet.

1. *Initial cost.* The unit should be within a minimum price structure. To obtain a minimum cost, mass production is required, and this must come from volume and standardization. Thus a package unit should be decided upon — one casing, one fan and motor — but varying sizes should be offered. At present, the range of 1½, 2, 3 and 5 ton systems seem to be adequate for most moderate cost homes, he said.

2. *Operating cost.* Each location will have a fixed operating cost and the contractor or selling agency should show the customer the costs to be expected. One ton of refrigeration will take approximately one kilowatt, including air handling equipment, of power. One ton of refrigeration will require approximately 90 gph of city water, or 210 gph of cooling tower water. Of the latter, approximately 5 per cent or 10 gph must be made up from the city mains.

3. *Ease of installation without skilled refrigeration labor.* Each component of the unit should be easily removable for replacement by personnel of the heating contractor. Fans, motors, controls, casings, and filters are generally known to the heating contractor, and can be serviced by him. The only thing foreign to the heating contractor will be the refrigeration cycle. This portion should be complete and removable as a unit, to be rereplaced if trouble develops, in Mr. Denges' opinion. The dealer or jobber should stock replacement units, but service on this part of the equipment should be done by the factory, he believes.

4. *Appearance.* The unit should blend with the furnace in design to assure customer satisfaction.

5. *Noise.* The function of air conditioning is heat removal. In heating, the outlet register temperature can vary from 100 F to 170 F without serious complaint. This wide register temperature variation cannot exist in cooling. The temperature difference between room conditions and cooled air should not be greater than 20 F without the use of specially designed and applied equipment, Mr. Denges said. The draft problem can create many service calls, even with correctly designed and engineered installations. Thus, since the temperature difference is an inverse function of cfm, the smaller the temperature difference, the greater the amount of air that must be handled. Therefore, the blower and motor must normally be larger in size for cooling than for heating. The resultant greater air movement may produce objectionable noise unless designing care is given to the selection of a blower with a suitable tip speed.

6. *Ease of operation.* The package unit should be complete without requiring adjustments to be made by the owner. The only control that the owner need know about should be a thermostat and a manual switch to turn the complete unit on or off. These two controls can be accessible through an access door on the unit, or they may also be located in the living quarters.

7. *Dependability.* All components should be of high quality. Mr. Denges said his company is using a hermetically sealed refrigeration cycle, which means that the refrigerant is sealed within the system. The charging and servicing cannot be performed without factory equipment and trained personnel. The motor driving the compressor is also sealed within the refrigeration system. Thus, the oil cannot leak out, nor does it need replacing, he said.

8. *Flexibility.* A new installation can be adapted to almost any design to provide cooling in a residence. The problem is to design units which can easily be installed in existing residences with warm air heating systems. The convenience of location can often reduce the installation cost to a point where the job can be sold.

Balance between the Btu removal of a cooling system and Btu input of the furnace is also very important. In certain localities, such as Cleveland, a house may require equipment which will provide 100,000 Btu per hr input for heating and only 24,000 Btu per hr removal for cooling, whereas this same house, located in Atlanta, may require equipment providing 65,000 Btu input for adequate heat but require cooling equipment with a removal capacity of 36,000 Btu per hr. Use of separate cooling units allows freedom in making selections of equipment to fit design requirements, Mr. Denges feels.

9. *Maintenance.* The only routine maintenance required should be periodical changing of throwaway filters and oiling of the blower and motor, which should be accessible through a removable door.

10. *Filtering.* To obtain cleanliness and proper operation of the cooling coil, filtering is required. Dirty filters will reduce air circulation and removal of filters will immediately create the effect of faulty refrigeration, due to collection of dirt on the cooling coil. Filters will need to be serviced regularly. The home owner should be educated to keep windows and doors closed.

11. *Electricity availability.* Increased electrical demand due to air conditioning may require new service lines. A check with the local electrical utility is advisable prior to installation of any cooling equipment to ascertain if sufficient power is available. This information is required to establish an accurate installation cost.

12. *Good air distribution and balance.* Here again heating and cooling differ. In general, a heating system distributes air of varying temperatures, and the balancing can be created by dampering certain sections of the system. The heat created by lights, people, appliances and sun is generally neglected. These heat sources, however, can be the primary loads of an air conditioning installation. Thus the balance of air quantity for the heating system will normally be different from the cooling system. In a living room having a south exposure the volume of air required for heating would be approximately the same for the same room having a north exposure. For cooling, the south exposure could demand as much as 200 per cent more air than the north exposure. Air volume required for cooling varies considerably from that required for heating on many installations. Thus a balanced system is essential for cooling, and this may have to be adjusted for the heating season and then changed back for summer operation. To reduce this variance to a minimum, continuous operation of the blower on the cooling system is a must, and has proven desirable for the heating cycle.

Discusses Engineering, Service and Sales

"Although selecting the equipment for cooling is extremely important, there are other factors of equal im-

(*Please turn to page* 146)

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Moncrief year-round air conditioning now fits into the plans of practically any type or size of home. Only a small amount of additional space is required for the Summer Air Conditioner which is installed alongside the heating unit. Also —no special duct work other than that installed for the heating unit is required in most sections of the country. Installation requires only electrical and water connections.

The Moncrief Cooling Unit also opens another big market to you, in existing houses. You can add it to existing forced air heating systems using the present duct and register system, and thereby make summer air conditioning available to thousands of prospects, at a nice profit to yourself.

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For installation in all types of buildings . . . schools . . . churches . . . offices . . . and others

Get complete information from your Moncrief jobber NOW! On these NEW—in-DEMAND *year round* Air Conditioners.

4 sizes 2-3-5-7½ ton capacities.

THE HENRY FURNACE COMPANY • *Medina, Ohio*

HEATING AND AIR CONDITIONING UNITS — MONCRIEF SINCE 1891 — FURNACE PIPE AND FITTINGS

AMONG THE officers of the association are *(l. to r.)* W. C. Steinhorst, retiring president; H. C. Gilbert, president elect; C. J. Meyer, executive secretary; R. W. Friday, first vice president; and F. V. Pils, second vice president.

Accent on Training and Selling As Contractors Meet

. . . in New York, where the state's association of sheet metal, roofing and air conditioning contractors heard about its group insurance plan, and about steps members could take to improve work standards

"APPRENTICESHIP IS the grass roots program of industry," David E. Greelis told the 30th annual convention of the New York State Sheet Metal, Roofing and Air Conditioning Contractors Association, Inc., which was held in Buffalo, January 18 to 21. Mr. Greelis, the state director of apprentice training, went on to describe how the training program is set up to help the sheet metal and air conditioning fields.

In New York, a seven man committee was appointed when the state authorized the program in 1941. This committee works constantly as a clearing house for the best ideas and practices. In this fashion, the board can establish the best procedures with the local chairmen and the schools.

The training program as established in the Buffalo area sets a course of 144 classroom hours per year. The apprentice spends 80 per cent of this time on theory, layout, and fabrication. The remainder of the time is spent in a mathematics class. The apprentice has two two-hour classes each week for which his employer pays half-time rate for attendance.

A number of awards are used to augment the Buffalo apprenticeship program. Joseph R. Stiglmeier, chairman of the program and convention chairman, announced the year's winners: James Feeling, Albany, first year; Donald Wagner, Buffalo, second year; Hershel McCarty, Syracuse, third year; and Joseph Libbentutt, Albany, fourth year.

Careful Promotion Will Increase Sales

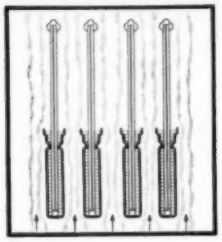
Robert W. Lear, advertising and sales promotion manager, American Radiator & Standard Sanitary Corp., told the contractors how carefully planned promotion can increase warm air sales. Mr. Lear briefly outlined

the Convector Humidifier...
BIG OPERATOR IN A SMALL SPACE!

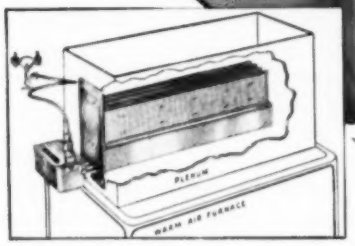
● Inch for inch and ounce for ounce, the Maid-O'-Mist Convector Humidifier outperforms pan type humidifiers 2 to 3 times its size. The evaporating area of the 18" 4-trough Convector Humidifier equals that of a pan type humidifier 50" long and 10" wide. Its efficiency secret is *evaporator pads in individual troughs* . . . an exclusive advantage that allows the warm air to flow freely between the pads and really load up on humidity . . . actually increases the evaporation area 30%. This is something to remember when selecting a humidifier for modern warm air heating systems.

Patented Evaporator Pads are constructed of corrugated long grain paper fillers with outer layers of asbestos. The corrugations form capillary tubes which greatly increase the water absorbing qualities of the pads.

View at left, shows the back plate extended to illustrate the individual trough construction. Entire humidifier is made of non-corrosive metals —copper and brass. 6 feet of ¼" O.D. copper tubing with saddle valve for water connections is also furnished.



Note above how Maid-O'-Mist's exclusive individual trough design allows the air to flow freely up between the evaporator pads. The entire area of each of the large evaporator pads is in direct contact with the warm air flow thus providing 30% more evaporating surface.



This view shows why installation time can be reduced by 50%. You just cut opening in plenum and make water connections. 13 sizes available with evaporation capacities of 1 to 10 gals. of water per day. Get full information on these competitively priced units from your jobber or write for Bulletin 701-B.

60%
less air restriction in plenum

30%
more evaporation area

50%
less installation time

MAID-O'-MIST Inc.
HEATING SPECIALTIES

AUTOMATIC HUMIDIFIERS . . . . . AUTO-VENTS
WATER LINE CONTROLS . HEATING SPECIALTIES

MAID-O'-MIST, Inc.

3217 NORTH PULASKI ROAD . CHICAGO 41, ILL.

ROBERT A. LEAR *(left)* told contractors how they could increase sales. With him is Lawrence Hock, Niagara Machine and Tool Co.

JOSEPH R. STIGLMEIER, manager, Davey Sheet Metal Shop, Buffalo, was chairman of the convention

the background of the warm air industry and its complexities, then concentrated his talk on contractor retailing. He said that the sales effort at the dealer level over the past few years has not equaled proportionately the total sales growth. This is especially serious, he feels, inasmuch as a selling period is on the way. The contractor must teach his entire organization to sell for the company and to concentrate on improved customer relations.

Recommending specific steps which will help the dealer increase warm air sales, Mr. Lear stressed first that the store be clean, well-located and well-lighted. Following progressively in sales importance is product display for demonstration, and local advertising through newspaper, direct mail, radio, and classified listings. Another important sales aid that can be exploited by the dealer is "transfer of reputation", or identification of the store as a source of supply for brand name products.

Finally, he pointed out that 1953 will be the beginning of a new era in summer cooling. The dealer should get into cooling "in a big way", and to do so, should attend every training clinic possible in company with his key men. This will increase his knowledge and implement his sales effort.

Group Insurance Plan Discussed

The association's group compensation program was discussed by D. L. Hayes, president, Laverack & Haines, group insurance managers. This program was inaugurated 11 years ago, and 1952 marked its most successful year, with payment of a 20 per cent dividend and an increase of $8000 in the surplus fund.

Mr. Hayes compared compensation rates for the past three years, which showed a sharp increase in the cost of insurance to the contractor. Outside of slightly higher operating costs, these increases are primarily due to increased claims, he said.

He cited as an example one recent claim award which set a precedent, so that 150 claims are now being processed for varying degrees of occupational deafness. Mr. Hayes urged each employer to report each accident immediately and fully for investigation, to determine a true claim.

Sheet Metal Work Should be Properly Assigned

Joseph D. Wilder, executive secretary, Sheet Metal Contractors' National Association, emphasized the importance of keeping work standards high. He said that the number of sheet metal contractors in the country who own a shop and employ at least one man totals approximately 15,000. "The bulk of the architect's troubles", Mr. Wilder said, "stem from dealing with fly-by-nighters and not with reputable concerns which are, by and large, members of the state associations." Problems of inadequate work arise also from bid shopping and bid peddling.

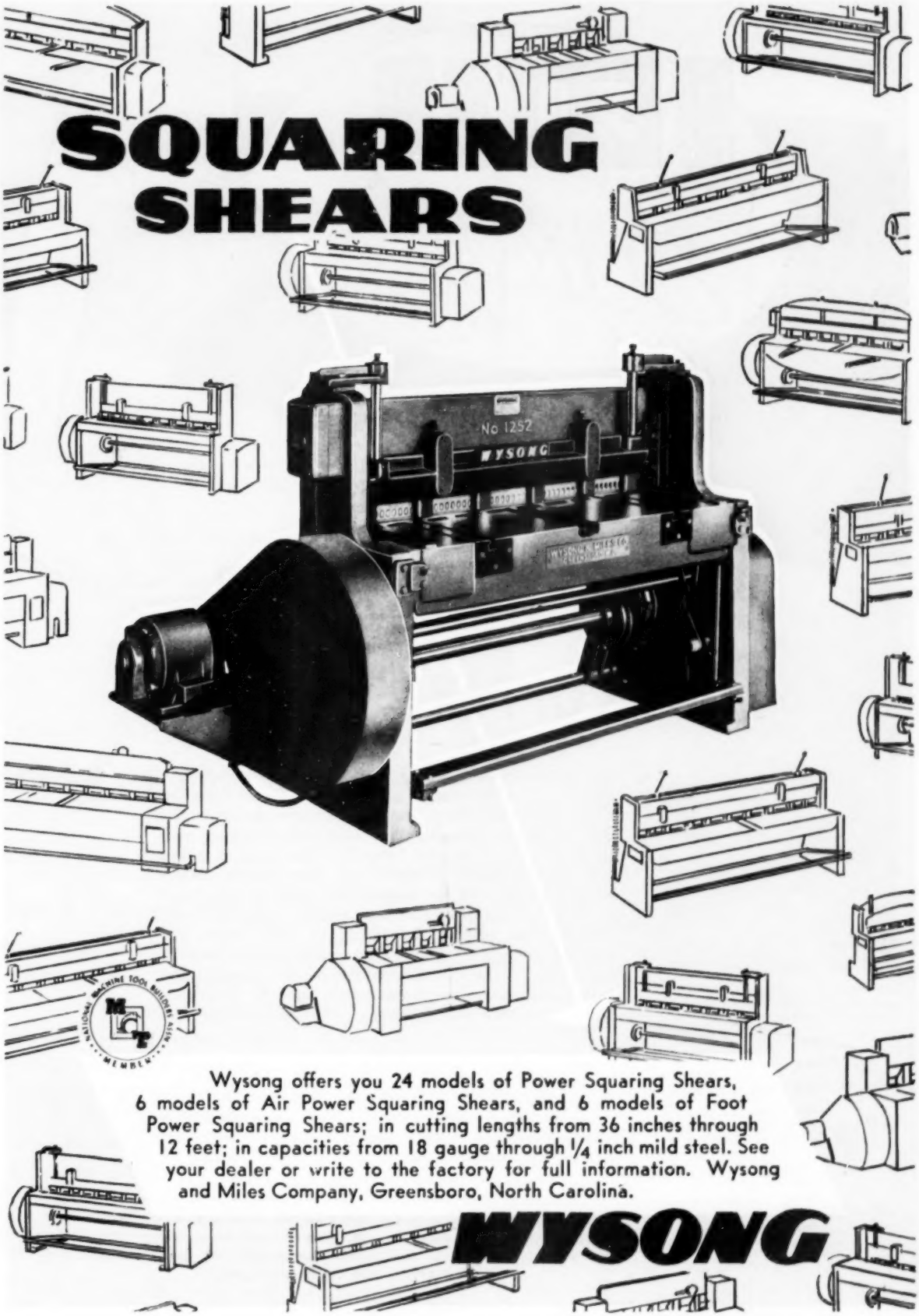
Recently the national association mailed to every registered architect in the country copies of the codes of trade practices governing ventilation and air conditioning, and general sheet metal work. Mr. Wilder urged that architects be requested to review these codes carefully so that they will assign to the sheet metal contractor all the work which properly comes within the sheet metal field.

In closing, Mr. Wilder said that the national association plans to establish a committee in the near future to study curtain wall construction. He urged that architects be informed that this work definitely belongs to the sheet metal workers by union agreement.

Officers and Directors Elected

The following officers and directors were nominated and elected: president, H. C. Gilbert, Buffalo; first vice

(Please turn to bottom of page 134)



Wysong offers you 24 models of Power Squaring Shears, 6 models of Air Power Squaring Shears, and 6 models of Foot Power Squaring Shears; in cutting lengths from 36 inches through 12 feet; in capacities from 18 gauge through 1/4 inch mild steel. See your dealer or write to the factory for full information. Wysong and Miles Company, Greensboro, North Carolina.

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3-Way Thru Wall

COPPER FLASHING

KEY BONDING ACTION

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COPPER & BRASS

7 Convenient Warehouses to serve you

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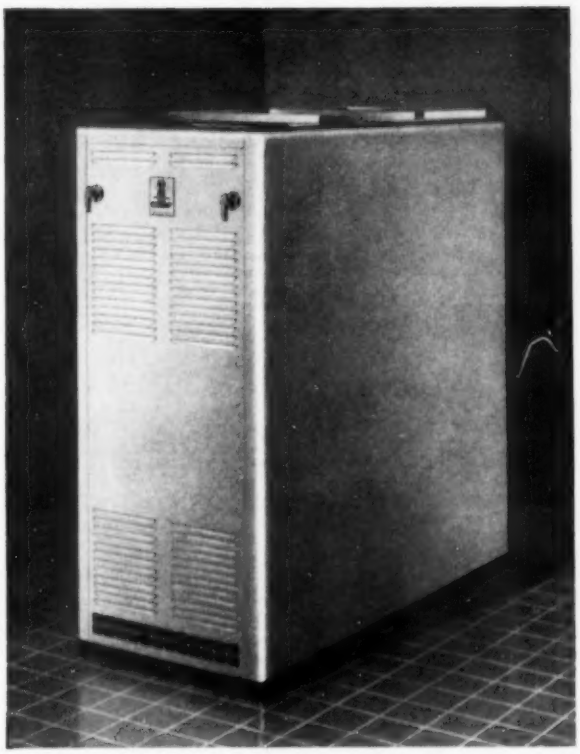
NEW YORK (13), 140 Sixth Ave. — PHILADELPHIA (30), 1632 Fairmount Ave.
CINCINNATI (2), 424 Commercial Square

Behind this name...

In the great, new International Economy line, you'll find *more* models, *more* features, *more* profit possibilities than ever before! From one dependable source, you can furnish your customers with the most modern, efficient and economical heating units — whether the fuel is oil, gas or coal!

For more than 110 years, International has specialized in home heating equipment — *earned* the reputation and acceptance that make your selling job easier. These completely new International Economy units are the *finest* we've ever made — and that's *really* saying something! But don't take *our* word for it — see your International Economy distributor — and see for yourself!



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OIL LO-BOYS

MODELS **OL-84**
OL-96

Look at these sales-clinching features:

Completely assembled—easier installation

Steel pan bottom—no grouting

Handsome heavy-gauge cabinet

Available with or without vestibule

Two assembled sizes—84,000 and 96,000 Btu. output

Five not-assembled Lo-boys available from 96,000 to 224,000 Btu. output

10-year warranty

Convertible to Gas

110 years of heating experience at your service . . . .

See your distributor—or write for catalog and details:

nternational heater co.
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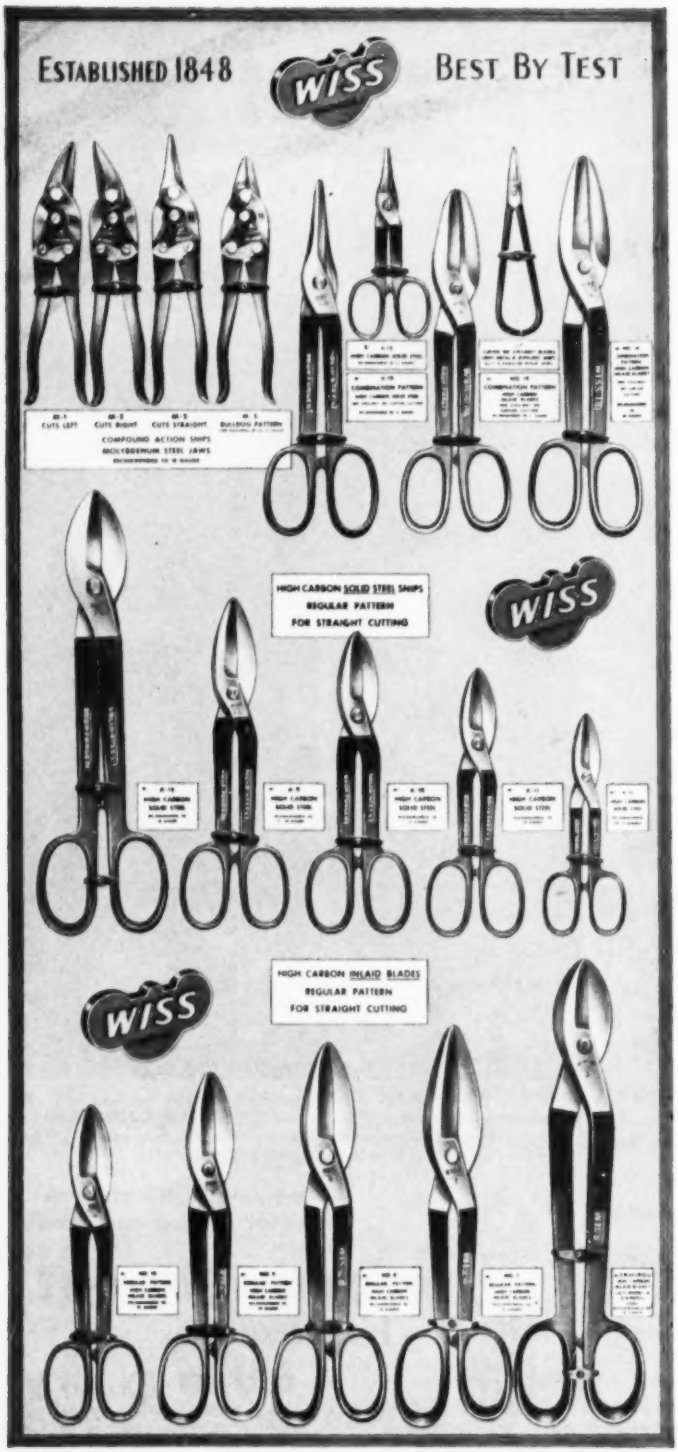
Western Office and Warehouse • 1933 Wentworth Ave., Chicago 16, Ill.

Better Snips Mean Better Jobs!



J. WISS & SONS CO., NEWARK 7, N. J.

Manufacturers of Shears, Scissors, Pinking Shears, Metal Cutting Snips and Garden Shears

That's why WISS snips are the first choice of master craftsmen. They are produced largely by the handwork of skilled workers. Each pair is rigidly tested and guaranteed perfect. Bolts are set precisely to reduce wear and to increase cutting power with least effort. Blades are accurately adjusted and stay in adjustment indefinitely. Edges have a special bevel which makes for easy cutting and assures lasting sharpness.

See the complete line of WISS Snips and choose exactly the right snip for your particular needs.

WISS METAL-MASTER SNIPS—Compound action design delivers amazing cutting power. These 10″ snips cut with about one-half the effort required for standard 12½″ snips. Hot drop forged of molybdenum alloy steel. One edge serrated to prevent slipping. M-1 (cuts left) and M-2 (cuts right) are designed to cut scrolls, circles or the most intricate designs. M-3 is for cutting shallow arcs and straight cutting. M-5 Bulldog Heavy Duty snips are tops for notching, nibbling and cutting shallow arcs in sheet metal as heavy as 16 gauge.

WISS INLAID BLADES

High carbon crucible steel welded to a tough drop forged frame provide that *extra* service demanded by professional users everywhere.

STRAIGHT CUTTING—The best snips for straight cutting. Gun metal finish handles. Tough crucible steel inlaid blades. 6 sizes from 9½″ to 17″, including Bulldog Snips for notching.

COMBINATION—Made with straight blades, but ground and shaped so they readily cut curves and irregular shapes as well as straight. 2 sizes—12½″ and 13½″ long.

WISS SOLID STEEL SNIPS

Hot drop forged of fine carbon steel. For those whose requirements are less specialized than the professional user, they provide every quality that could be asked and meet or exceed government specifications for metal cutting tools.

STRAIGHT CUTTING—For garages, machine shops, home workshops, the farm. 4 sizes from 8″ to 16″ long, including Bulldog Snips for notching.

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YOUR BUSINESS AND THE LAW

When is Notice to Agent Binding on Contractor?

Albert W. Gray

If a buyer rejects defective equipment, he must notify the contractor or manufacturer through a recognized agent, not a service man or other persons. And for the notice to be binding, the matter at hand must come within the scope of the agent's authority

A HEATING CONTRACTOR recently sued for the price of an air conditioning installation he had sold to a cafe owner in his state. The defense of this cafe owner to the lawsuit was that the air conditioning had been installed on approval, had been unsatisfactory, and that he had notified the contractor to remove the equipment, which the contractor had failed to do.

A representative of the manufacturer of the air conditioning equipment had called on the cafe owner in August and agreed to install equipment of this manufacture for a week's trial. It was agreed that if at the end of the week the cafe owner found the equipment supplied cool air during warm and hot weather, he would keep and pay for it. However, if it did not, he should give the contractor notice to that effect.

The installation was completed on September 4. Since the season in which the cafe owner could test the operation of the installation had passed, the trial period was extended until the hot weather of the following summer.

In the late fall of that year the contractor disconnected the water to avoid freezing, and the following spring, when the contractor's service man called to restore this water connection, the owner told him not to do so, that he would take care of it himself.

The contractor received no notice from the cafe owner and on August 1 forwarded him a bill for the price agreed. The following day, the cafe owner notified him he did not want the equipment and asked that it be removed.

Service Man is Not Agent

At the trial of this suit brought by the contractor for the price of this equipment, the cafe owner testified that when the service man had come to his place that spring he had told him that he did not intend to buy the equipment and didn't want it.

The supreme court of the state held that this cafe owner was liable for the price of the equipment and that any notice he had given this employee was not a notice to the contractor either of his dissatisfaction or of his wish that the air conditioning installation be removed.

That court said of the authority of this employee, "He was a mechanic. His limited employment gave him no right to bind the contractor in any contract. He was not the business representative of the contractor and had no authority to act in his place and stead. His acts were confined to what he was directed to do.

"The line of demarcation between the relation of principal and agent and that of master and servant is exceedingly difficult to define. The vital point of distinction is that the agent is not only employed by the principal but represents him as well. He is the business representative of the principal and acts not only for the principal but in the place and instead of the principal. The servant, on the other hand, simply acts for the principal and usually according to his directions without discrimination."

When is Notice to Agent Notice to Employer?

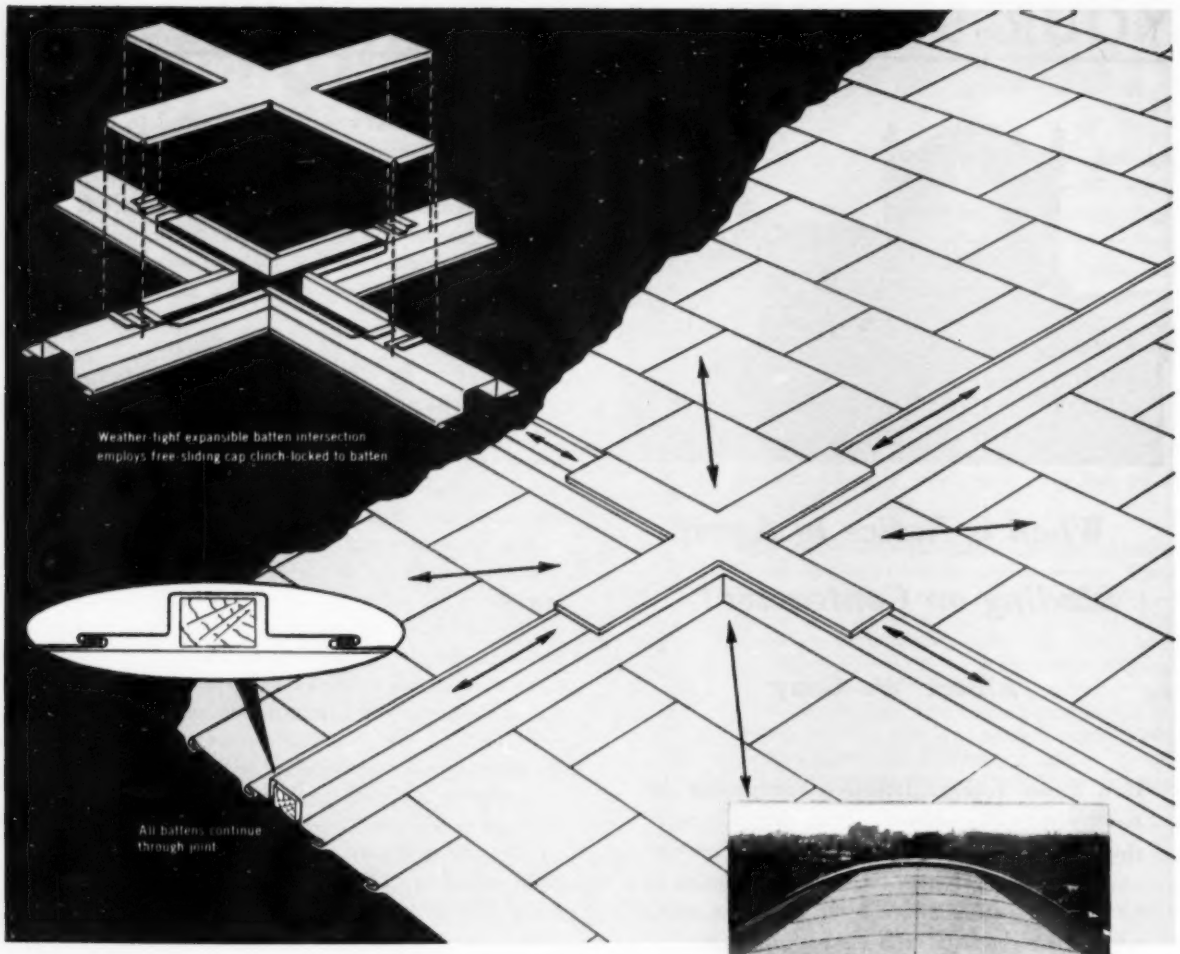
In contrast to this air conditioning case is an incident occurring in another state in which the court held that the notice to the agent was notice to the employer. In the sale of a crop of tobacco the buyer's representative was told by a part owner of the crop that the seller with whom the buyer had been dealing had but a half interest and that he himself owned the other half. He warned this representative that half the money paid by the buyer should be paid to him.

When the buyer paid the entire price to the man with whom he had been dealing and failed to pay half of the amount to this other part owner, that half owner sued for his share, claiming his notice to the buyer's agent was notice to the buyer.

The court, deciding in favor of the seller who had been thus bypassed in payment, said,

"It may be stated as a general proposition that notice

Albert W. Gray, author of this article, has had twenty years experience as an attorney in the courts of New York City. He has written widely on legal matters and is the author of "The Family Legal Adviser".


Weather-tight expansible batten intersection employs free-sliding cap clinch-locked to batten
All battens continue through joint

90 thousand square feet of ANACONDA Copper on Convention Hall, Philadelphia.

HOW TO DESIGN A WEATHER-TIGHT

EXPANSIBLE BATTEN INTERSECTION

On large roof areas of flat seam copper roofing, provision for expansion may be made by dividing the roof into areas approximately 40-ft. square and separated by expansion battens. In addition to allowing for expansion within the 40-ft. area, the design of the battens must also permit expansion at the batten intersections.

This drawing shows a practical weather-tight design for such an expansible intersection. It is suitable for the crown of a vaulted roof such as that shown in the photograph or at the ridge of a low-pitch roof. Note that the free-sliding cap is clinch-locked to the battens and that no solder is required. 5340

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to the agent is, in contemplation of law, notice to the principal in reference to or in connection with any business in which the agent is engaged by the authority of the principal and where the information is so important a fact in the transaction as to make it his duty to communicate it to his principal. This doctrine is based upon the principle of law that it is the agent's duty to communicate to his principal knowledge which he has respecting any transactions in which the agent is engaged for the principal and the presumption that he will perform his duty."

Must Consider Scope of Agent's Authority

An attempt in another state to implement the rule that the knowledge of an agent is the knowledge of the employer or principal failed. A son in a family of several children had the custody of his father's will with the knowledge and consent of the others. It was contended that his knowledge of the execution of the will was the knowledge of the other members of the family. In that case the court said,

"It is true that under proper restrictions knowledge acquired by an agent will be imputed to the principal, but this is true only where the agent acquires such knowledge while in the performance of the principal's business and where acting with reference to the matter for which his agency was created. Where one, in performing a mere ministerial duty, learns facts material if known to his principal, there is no imputation of such knowledge as to the principal."

This decision followed the authority of another case in which a state supreme court said in outlining this law,

"It is a familiar and well settled rule that as to third parties notice to an agent while acting within the scope of his authority is notice to the principal.

"If it relates to a matter over which the agent has no authority, although he may be an agent for all other purposes, it will not affect the principal or be binding on him."

According to these principles notice by a customer to the employee of a contractor either of the cancellation of a sale, of claims for defects or of similar incidents is notice to the contractor or employer when the employee receiving the notice is employed in the transaction to which the notice relates or when the employee is under a duty to communicate the contents of such a notice to his employer.

[Note: While this discussion applies to actual cases, it should be remembered that legal rules vary in different states.]

Heating Men Make Good Use of Sales Training

A NEW EDUCATIONAL program launched by Minneapolis-Honeywell Regulator Co. to help heating dealers increase sales was reported in *Seven Steps to Greater Dealer Sales*, in the August 1952, American Artisan. The program, which involves a specially prepared set of seven merchandising books, has met with wide acceptance in the succeeding months, according to H. D. Bissell, director of merchandising for the company.

A number of reports from individual dealers indicate how the training has helped them. For example, Baerenklau and Co., Inc., Brooklyn, N.Y., reported that, in accordance with recommendations in the books, the following steps have been taken:

1. New uniforms have been bought for all outside men, and all trucks have been painted — indicating an increased emphasis on cleanliness designed to appeal to housewives.

2. Advertising has been started in local busses. As a result, it was reported, people now call on the company who previously did not know whom to contact when looking for a heating dealer.

3. The mailing lists have been completely overhauled and put to more active use, resulting in a much higher response to mailings.

4. It has been made a requirement that all the employees read one of the books in the series, *Making Every Employee a Salesman*. Since this practice was begun, the company has received numerous compliments on the courtesy of the employees — compliments which the company feels will bring sales results.

Another dealer, James D. Kirby, of Kirby Sheet Metal Works, Inc., Chicago, reported that his business volume had increased about 20 per cent over the corresponding period last year, an increase he attributes to "practicing some of the merchandising principles outlined in the program." He said he found the book, *Keeping the Public Sold on You* particularly helpful and had enjoyed participating in local homes shows, parades and community gatherings, as it suggested.

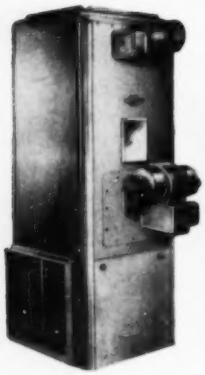
The program has been greeted with widespread interest even outside the heating industry, according to Mr. Bissell, reflecting a general desire for more effective merchandising at the dealer level.

OHI TO HOLD CONVENTION

A RECORD turnout of some 800 automatic oil heating equipment and fuel oil dealers, wholesalers, jobbers, distributors, manufacturers and others is expected at the 31st annual convention of the Oil-Heat Institute of America, to be held April 20 to 22, at the Edgewater Beach Hotel, Chicago.

On the first day, the board of directors and other officers will be elected. During the morning and afternoon sessions on the next two days, information will be offered on such subjects as comfort trends in heating, dealer opportunities in residential cooling, how to increase profits in the heating business, the new home market, the ever-increasing replacement and modernization market, providing fair service to the customer, etc.

The Old Timers will meet on the first night, and the accessory division luncheon is on April 21.



OIL-FIRED CONDITIONAIR
MODEL OPC-75H

Quick action heat transfer unit delivers more heat to home, less to chimney. Capacity 75,000 Btu. per hour. Centrifugal Blower and Burner driven by Delco-built, quiet, vibration-free Rigidframe motor. High and low models, and Reverse Flow for perimeter heating.

GAS-FIRED CONDITIONAIR
MODEL GA-150

Multi-Rad radiators and double ribbon type Burner gets more heat out of smaller, quieter, cleaner flame. Delco-built Rigidframe motor runs Centrifugal Blower. Output 120,000 Btu. per hour. Humidifier available. For natural, manufactured or mixed gas.

Get the facts about the new franchise territories available now. Write: Delco Appliance Division, Dept. AA, General Motors Corporation, Rochester 1, N.Y.

DELCO-HEAT

gives you value leader prices to outsell competition

Make yourself heating headquarters for your community with the Delco-Heat "one two" punch of top quality and low, low selling prices. It's a combination your competition can't beat – the result of General Motors famous engineering and production-skill.

Here is the most valuable franchise in the heating industry:

- Complete line of Conditionairs – all capacities – gas or oil-fired
- Packaged units for quick, easy, low-cost installation
- Exclusive, self-selling features and synchronized controls
- Years-ahead General Motors engineering for new developments
- Unsurpassed mechanical perfection for minimum servicing
- Full-scale sales and engineering training
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Here, indeed is the shortest, most direct route to profits.

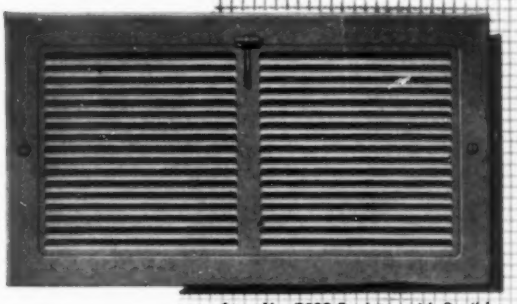
For a good deal – DEAL WITH DELCO

GENERAL MOTORS
DELCO-HEAT

. . . a complete line of automatic oil and gas-fired conversion burners. Conditionair forced warm air furnaces, boilers, water heaters and electric water systems.

Auer fills all your Register needs FROM ONE RELIABLE SOURCE

Why not take advantage of the time-saving convenience of filling all your register needs from the complete dependable line made by The Auer Register Co.? Here are registers and grilles for all purposes—gravity or air conditioning.



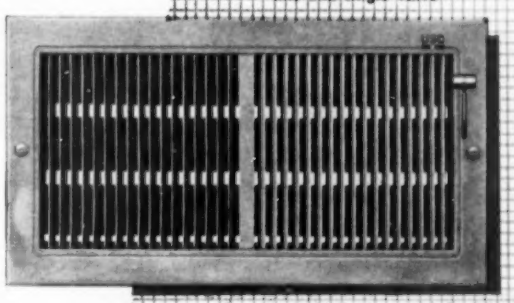
Auer No. 7032 Register with flexible fins and single valve

Auer REGISTERS

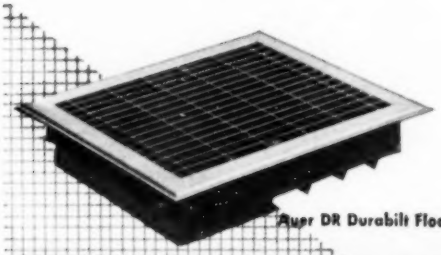
QUALITY CONTROLLED PRODUCTION

When you install Auer registers, you have the assurance of accurate dimensions and uniform high quality—the result of Auer's system of strict quality control of production.

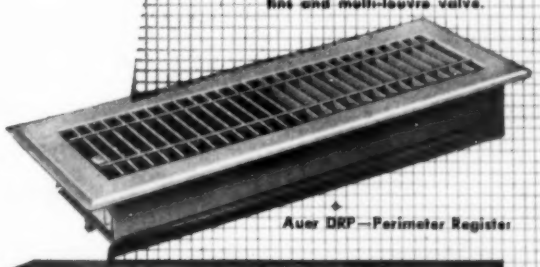
Write for the 30-page Auer Register Book for complete information.



Auer No. 4432 Register with flexible fins and multi-louvre valve.

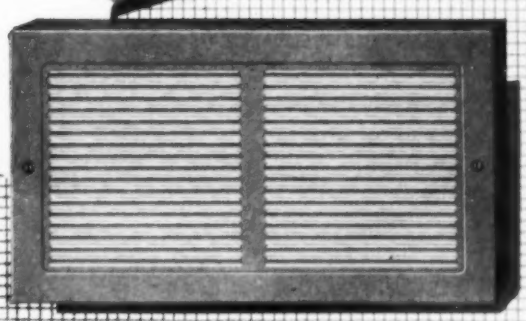


Auer DR Durabilt Floor Register



Auer DRP—Perimeter Register

Auer H-800 Heat Rite Baseboard Register



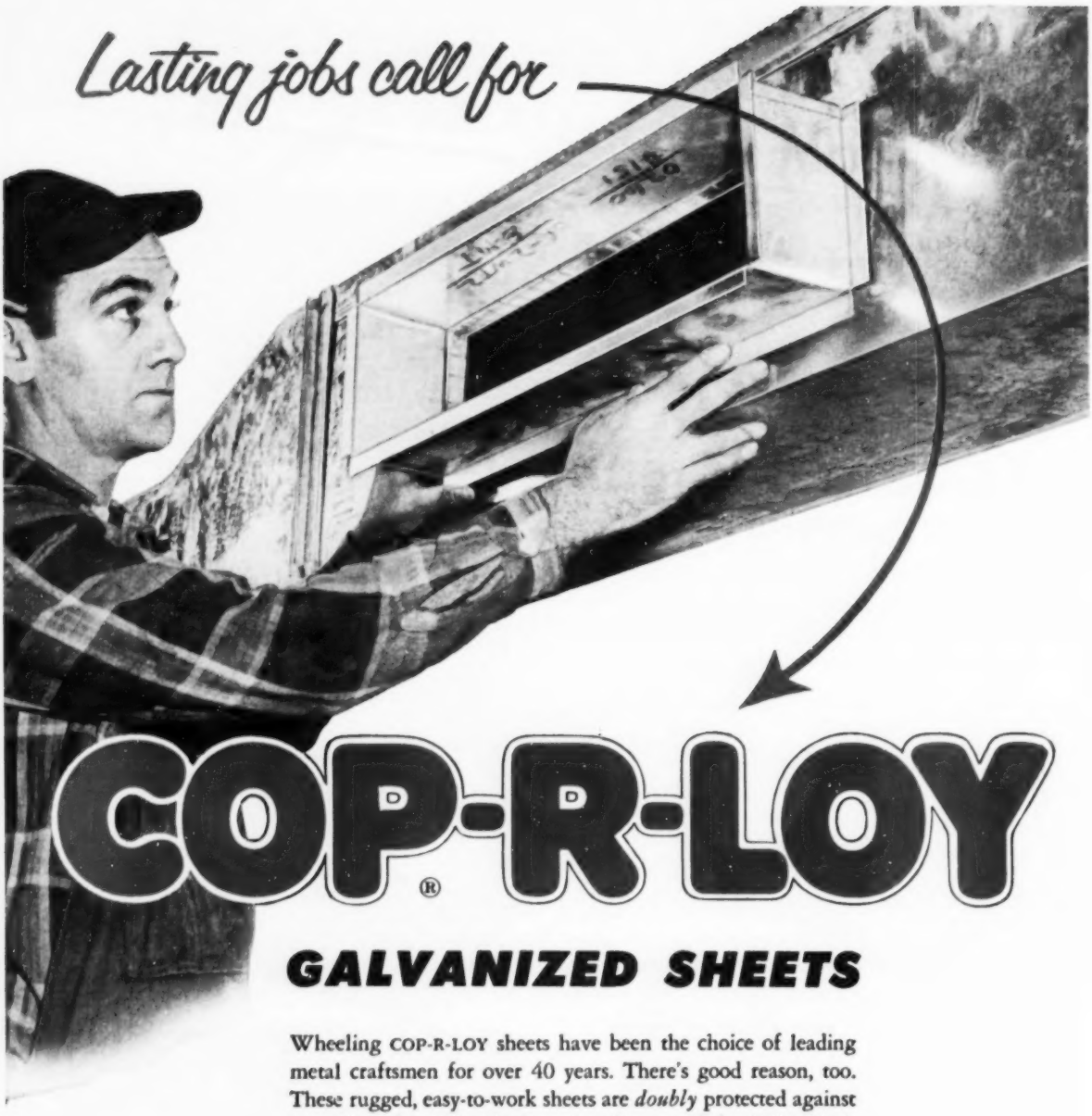
Auer No. 7043 Baseboard Intake

Auer REGISTERS and GRILLES

THE AUER REGISTER CO. 6600 CLEMENT AVE. • CLEVELAND 5, OHIO

Canadian Distributor—Marchand Furnace Ltd., Tilbury, Ont.

Lasting jobs call for



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Wheeling COP-R-LOY sheets have been the choice of leading metal craftsmen for over 40 years. There's good reason, too. These rugged, easy-to-work sheets are *doubly* protected against corrosion: by Wheeling's galvanizing, and by Wheeling's COP-R-LOY formula in the base metal. Together, these two big features make COP-R-LOY outstanding for exceptional durability.

Steel does it better... COP-R-LOY does it best!

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Why you should sell Chrysler Airtemp!

Gas or Oil-Fired Winter Air Conditioners—Hi-Boys

Gas or Oil-Fired Winter Air Conditioners—Lo-Boys

You have greater opportunity for year 'round profits as a Chrysler Airtemp Dealer. Check these important facts and see why:

- **Your selling job is easier!**

People have confidence in the fine quality of Chrysler Airtemp products. This name is nationally known and respected.

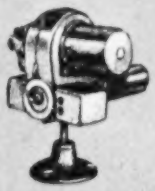
- **National Advertising creates prospects for you!**

The benefits of modern heating and air conditioning are told to YOUR prospects by a consistent national advertising campaign. This creates a demand for the Chrysler Airtemp products you sell.

- **You make EXTRA profits!**

Sell Year 'Round Air Conditioning with home heating for extra profits. When you sell Chrysler Airtemp you're sure it's the best. This is proven by the experience of thousands of satisfied users.

Get all the facts today about this valuable franchise. See why YOU should sell Chrysler Airtemp! Mail the coupon today.



Focused-Flame Oil Burners

Year-'Round Air Conditioners

Guaranteed by Good Housekeeping

Chrysler Airtemp

Comfort Zone

HEATING • AIR CONDITIONING FOR HOME, BUSINESS, INDUSTRY

AIRTEMP DIVISION OF CHRYSLER CORPORATION
DAYTON 1, OHIO

Airtemp Division of Chrysler Corporation AA-3-53
P.O. Box 1037, Dayton 1, Ohio

I would like to know more about Chrysler Airtemp's franchise arrangements.

Name _____

Address _____ Phone _____

City _____ Zone ____ State _____

Illinois Association Appoints Convention Chairmen

R. S. QUIMBY has been appointed convention chairman for the 39th annual convention of the Sheet Metal Contractors Association of Illinois, Inc. Rudy Guenther is chairman of the hospitality room.

NWAHACA Schedules Courses and Conferences

WARM AIR HEATING short courses, co-sponsored by the National Warm Air Heating & Air Conditioning Association, are being offered by Iowa State College, Ames, Iowa, March 23 to 26; Michigan State College, East Lansing, Mich., March 30 to April 2; Penn State College, State College, Pa., April 1 to 4, and Purdue University, Lafayette, Ind., April 1 to 4.

Indoor comfort conferences have been scheduled as follows: Little Rock, March 30 to 31; Kansas City, Mo., April 2 to 3; Wichita, April 6 to 7; Albuquerque, April 14 to 15; Fargo, N. D., April 22 to 23; Grand Island, Neb., April 27 to 28. The above include revised dates for Albuquerque and Fargo.

C. E. Israel, president, Canadian chapter of the association, opened the 1953 indoor comfort schools with an address to the 43 delegates in attendance at the London school. He briefly outlined the progress of the warm air heating industry in Canada since the formation of the chapter and pointed out that the annual average production rate had increased from 20,000 units at that time to over 100,000 units at present. In Toronto, C. B. Taylor, managing director of the chapter, told the delegates that an average of 45 delegates had attended the 69 classes held since the schools were founded.

New York Group Elects Officers

OFFICERS ELECTED at the December meeting of the Roofing and Sheet Metal Crafts Institute to serve for 1953 are: president, Irving Koppelson; vice presidents, F. Wm. Tischler, I. Dominick, and M. Schwartzman; treasurer, Thomas Wynne; corresponding secretary, Lawrence C. Corvi; recording secretary, Richard H. Freyberg; and sergeant-at-arms, Sam Feinberg. Elected to the board of directors are Bernard Fisher and Louis Moskowitz. The auditing committee will consist of Irving Popick, Richard H. Freyberg, and Louis Moskowitz.

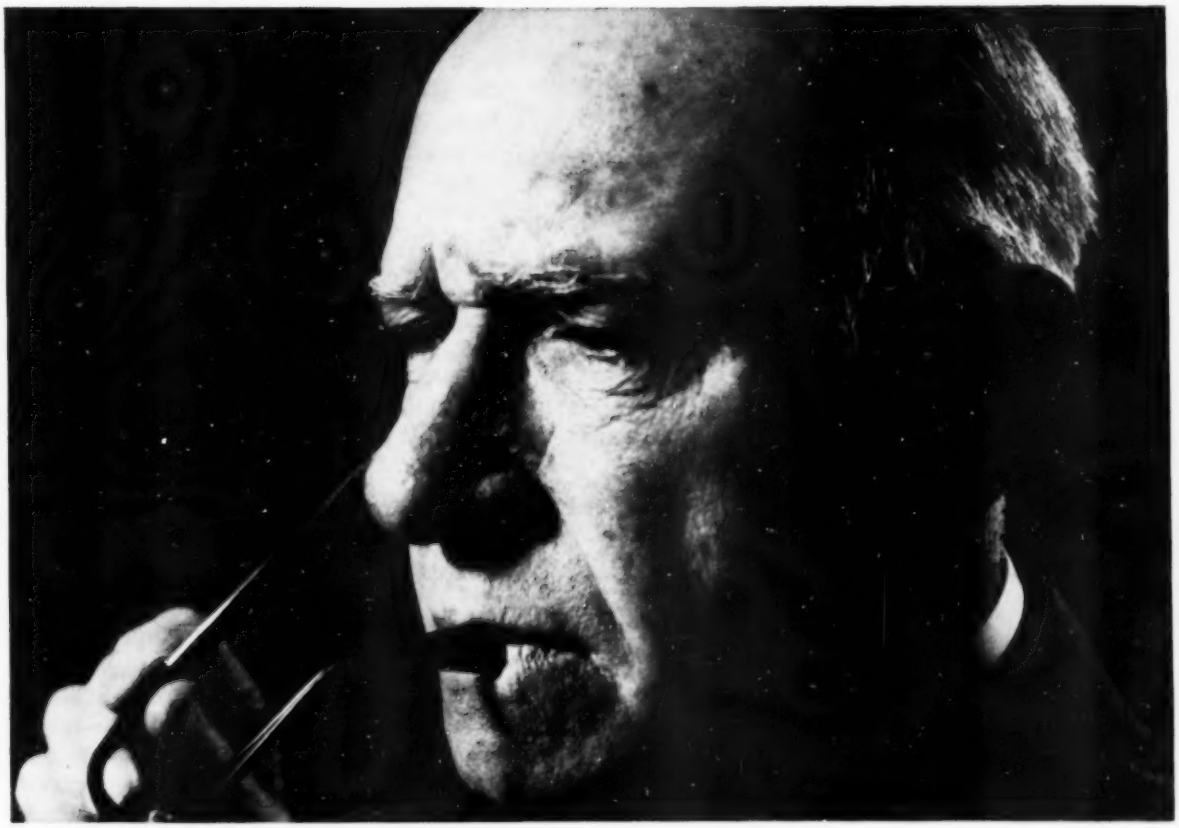
Educational Film Shown at Kalamazoo Meeting

TWO TECHNICOLOR MOVIES, one on basic electricity and the other on electronics, were shown at the February meeting of the Kalamazoo Sheet Metal, Roofing, Heating & Air Conditioning Contractors Association by Gene Kundmueller, Minneapolis-Honeywell Regulator Co.

THE 79 DELEGATES attending the Toronto indoor comfort school in January raised the attendance figure since the schools were started to well over the 3100 mark

TIPS ON SELLING FURNACES—REMEMBER . . .

MEN ARE VERY CHOOSY



He may have something special in mind. Or, he may just be choosy. Either way, when you give him more to choose from, the man is more apt to buy your product.

Rheem helps you make greater furnace profits by giving you more to sell — your customer more to choose from. Whatever he may need or want—Winter Air Conditioner, Gravity Furnace, Wall or Floor Furnace or Console Heater—Rheem has it. Rheem builds furnaces for every type home, for every size budget.

And Rheem gives you the best to sell, too. First, the exciting Fire-Tested story—the story of real quality. Second, the full Rheem warranty that says what it means and means what it says.

Only Rheem gives you such a complete line of furnaces. Only Rheem gives your customers so much to choose from. Write today for free booklet.

RHEEM MANUFACTURING CO. AA-3
4361 Firestone Blvd., South Gate, Calif.
Send free, illustrated furnace booklet.
Name_____
Address_____
City_____ State_____

RHEEM MANUFACTURING COMPANY

Guaranteed by Good Housekeeping

World's Fastest Growing Manufacturers of Warm-Air Heating Equipment

© 1953, RHEEM MFG. CO.

Coming Events

Mar. 25-27 — American Power Conference, Annual Meeting. Sherman Hotel, Chicago. Edwin R. Whitehead, Secretary, Illinois Institute of Technology, Technology Center, Chicago 16.

Apr. 10-11 — Roofing and Sheet Metal Contractors' Association of Florida, Annual Convention. Hotel Pennsylvania, West Palm Beach. P. D. Arnold, Secretary, P.O. Box 37, Clearwater, Fla.

Apr. 13-15 — Wholesale Roofings Association, First Annual Roofing, Heating, Insulation Exhibit. Convention Hall, Philadelphia. Daniel Cades, Chairman, 2nd and Fishers Ave., Philadelphia 20.

Apr. 15-16 — Sheet Metal Contractors' Association of Illinois, Inc., Annual Convention. Jefferson Hotel, Peoria. E. A. Schmidt, Secretary, 1210 E. Laurel St., Springfield, Ill.

Apr. 20-22 — Oil Heat Institute of America, Inc., Annual Convention. Edgewater Beach Hotel, Chicago. R. H. L. Becker, Managing Director, 6 E. 39th St., New York 16.

Apr. 24-25 — Air Conditioning Conference. Packard Auditorium, Lehigh University, Bethlehem, Pa. James V. D. Eppes, Chairman, Mechanical Engineering Dept., Lehigh University, Bethlehem. Also sponsored by NWAHACA, ASHVE, ASRE, ASME, ACRMA and other groups.

May 4-6 — Sheet Metal Contractors' National Association, Annual Convention. Jung Hotel, New Orleans. J. D. Wilder, Executive Secretary, 170 Division St., Elgin, Ill.

June 2-5 — Oil Heat Institute of New England, Eastern Biennial Exposition of Oil Heat. Hotel Statler, Boston. Thomas G. Colter, Chairman, 1953 Exposition, 839 Beacon St., Boston 15.

June 11-13 — Roofing and Sheet Metal Contractors' Association of Georgia, Annual Summer Convention. General Oglethorpe Hotel, Savannah, Ga. B. L. Noblitt, Secretary, P.O. Box 1196, Augusta.

June 18-20 — Carolinas Roofing and Sheet Metal Contractors' Association, Annual Convention. Ocean Forest Hotel, Myrtle Beach, S. C. Beverly M. Rose, Secretary, P.O. Box 708, Durham, N. C.

June 29-July 1 — American Society of Heating and Ventilating Engineers, Semi-Annual Meeting, Denver. A. V. Hutchinson, Executive Secretary, 62 Worth St., New York 13.

After the show, he explained more fully the operation of electronic controls and held a brief question and answer period.

Georgia Contractors Hold Winter Meeting

THE MIDYEAR MEETING of the Roofing and Sheet Metal Contractors' Association of Georgia was held on January 10 at the Ralston Hotel, Columbus, Ga. While the governing board and the members usually hold separate meetings, President Jones, in this instance, combined the two meetings into one general session, explaining that he had done so because of the number of important matters scheduled for discussion.

Registration Act Urged by Minnesota Association

THE SHEET METAL AND ROOFING Contractors' Association of Minnesota is urging the passage of an act establishing minimum standards for warm air heating, ventilating, and air conditioning installations and creating a state board with which contractors doing such work must file a performance bond and compliance certificate. Such a board would have authority to prohibit use of installations it found hazardous, and would impose penalties for violations of the minimum standards defined by the act. The association has sent all members a copy of a petition for such a registration act and has requested them to obtain as many signatures as possible.

THE GOVERNING BOARD and members of the Georgia association discussed a variety of plans at their recent midyear meeting.

The **NEW** "DELAYTROL" *delayed-opening valve*

gives cleaner starts — faster cutoff — in any position

• Here is a WEBSTER ELECTRIC "*First*" that is outstanding! The new "Delaytrol" delayed-opening valve puts an end to the "double trouble" of smoky starts and stops. It delays delivery of oil to nozzle *6 to 8 seconds on cold starts*, allowing motor to come to full speed and establishing full draft, and assuring complete atomization and the proper amount of air for combustion.

On the shutdown, "Delaytrol" cuts off the fuel supply instantly, extinguishing the flame while the draft fan is still operating at full speed. As a result, sooting of flue passages, nozzle tips and electrodes is greatly reduced; combustion rumbles, puff-back and flutter on starts and stops are eliminated; all gases are properly exhausted, and combustion is maintained at peak efficiency for heating economy.

• **a versatile accessory:** "Delaytrol" is a *complete separate unit*—available as an accessory for installation in the nozzle line of any high-pressure oil-burning installation. *It operates in any position*, hence may be installed at the most convenient location, on existing systems. No special fittings or supports are needed, in most cases, for installation on fuel-unit or line.

• **operates in normally closed position:** "Delaytrol" operates in a normally closed position, in the nozzle line, where line pressure helps to maintain firm seating. The special design of valve and electromagnetic unit gives instantaneous, positive cutoff.

• **easy to install:** "Delaytrol's" small size and unique new "straight-through" design permit installing directly on the fuel-unit, or at any point along the nozzle line. Male inlet and female outlet fittings make installation easy.

• **"Delaytrol" is dependable:** Heavy-duty electric units combined with a special composition valve assure long and trouble-free operation from "Delaytrol"—the *dependable* delayed-opening valve.

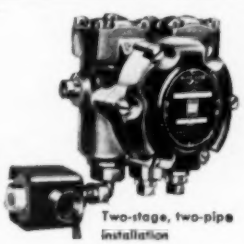
WEBSTER ELECTRIC

RACINE • WISCONSIN

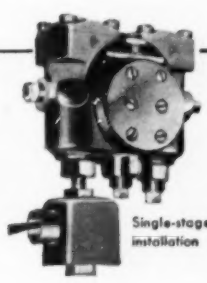
"Where Quality is a Responsibility and Fair Dealing an Obligation"

Webster Electric Company, Racine, Wisconsin • Established 1909

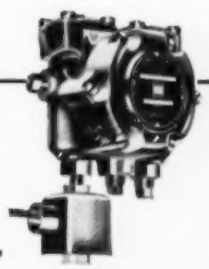
• *Piping Arrangements for the new* "DELAYTROL" *delayed opening valve*



Two-stage, two-pipe installation



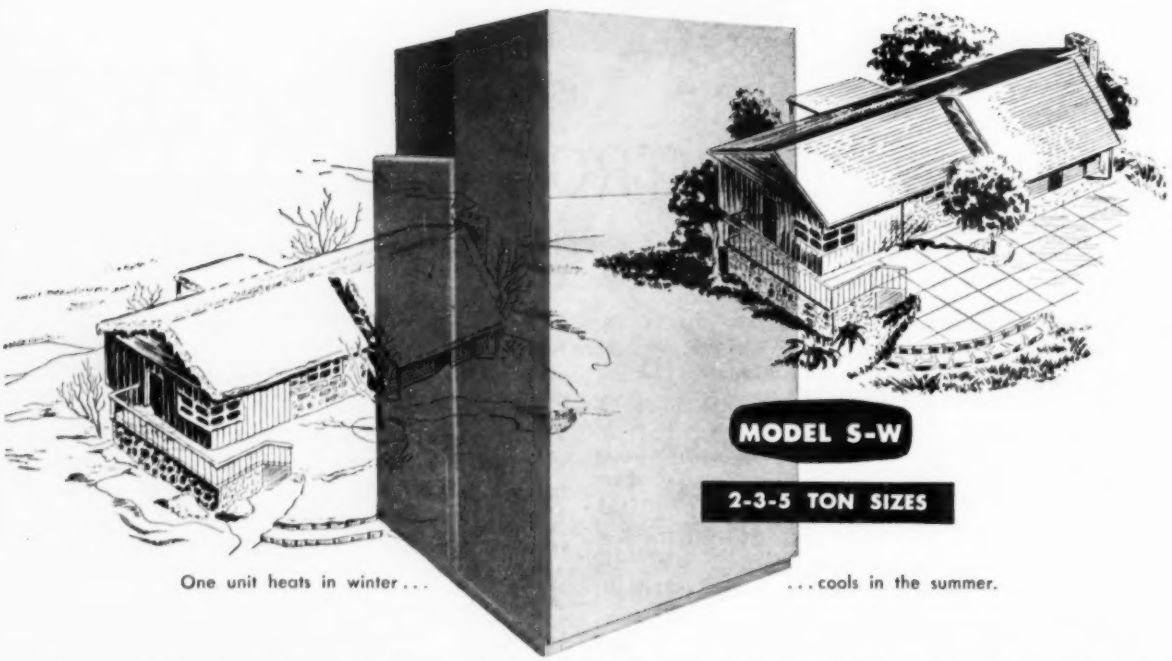
Single-stage, one-pipe installation



Two-stage, one-pipe installation

Biggest Thing in Home Comfort Since Central Heating

AND TYPHOON HAS IT



YEAR-ROUND AIR CONDITIONER FOR THE HOME

Take a quick survey today. How many new homes going up in your area? How many old homes already have warm air ducts? It adds up to a boom market for year-round air conditioning — and it's yours with Typhoon Model S-W!

44 YEARS OF COMFORT ENGINEERING IN THESE EXCLUSIVE TYPHOON FEATURES!

ONLY TYPHOON has one-button control — summer or winter, a touch of a button brings cool air or warm... automatically!

ONLY TYPHOON has an all-copper condenser—it defies rust and corrosion, gives trouble-free service.

ONLY TYPHOON is a miracle of compactness—takes up less space than any other unit, can even fit into a standard closet!

ONLY TYPHOON has *completely* automatic changeover design—for switching from heating to cooling; no dampers to manipulate!

SIMPLE TO INSTALL — Just a few quick connections and within hours your Typhoon unit is ready to function.

INEXPENSIVE TO OPERATE — Engineered to the point of greatest economy consistent with dependable performance.

QUIET — Completely insulated heavy-gauge steel cabinet and floating spring base assure whisper-quiet operation.

A.G.A. APPROVED. Perfected, Tested and Factory-Guaranteed by Typhoon.

Year-Round Air Conditioning With ONE CENTRAL UNIT Fully Automatic

A TYPHOON FRANCHISE is your key to this great new home market — write, wire, phone for information today.

TYPHOON AIR CONDITIONING CO. INC., 794 Union Street, Brooklyn 15, N. Y.

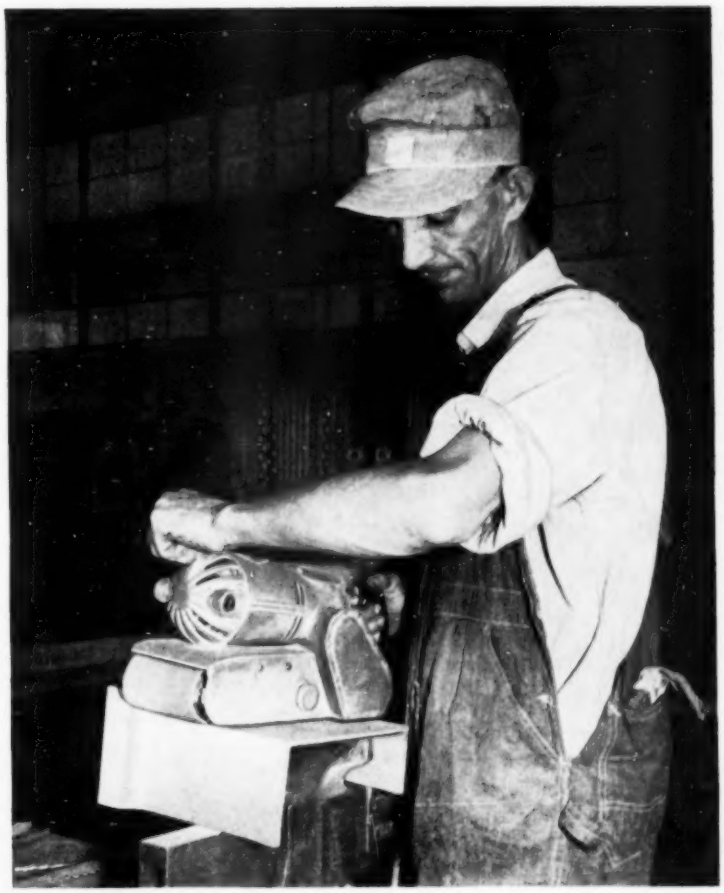
Specialists in Air Conditioning Since 1909.

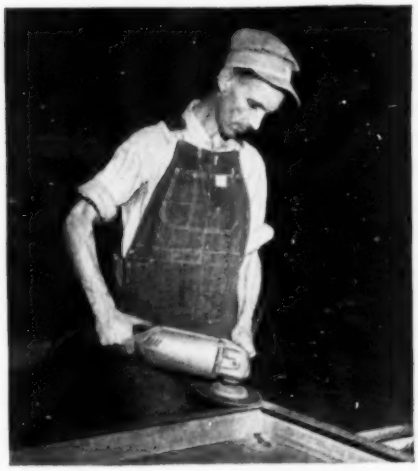
"SKIL Sanders?... best performance, least maintenance, most durable of all we've used!"

says **Roy Hollcroft,**
W. & W. STEEL COMPANY,
Oklahoma City, Oklahoma

"We've refinished metal with this model 323 SKIL Belt Sander for more than three years. It has the reserve power and right weight you've got to have for this work. It's taken plenty of punishment without giving any trouble. Beyond question SKIL makes the most *durable* belt sanders.

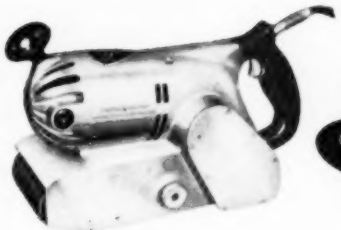
"We've had our SKIL Disc Sander in constant use for *five* years," Hollcroft continues, "and it's given us far better performance than any other make. In all this time, we haven't laid out a penny for repairs."





SKIL
PORTABLE TOOLS

Made only by SKIL Corporation
formerly SKILSAW, Inc.
5033 Elston Avenue, Chicago 30, Illinois
SKIL Factory Branches in 34 Principal Cities
In Canada: Skiltools, Ltd., 3601 Dundas Street West, Toronto 9, Ontario



SKIL Belt Sander—Model 323—Heavy duty for all sanding. Extremely powerful and sturdy for constant use. Belt width: 4½". No-load speed: 1300 r.p.m. Overall length: 15¾". Net weight: 23 lbs.

SKIL 7" Disc Sander—Model 11—Heavy duty. Ideal for removing weld marks on sheet metal; for auto body, truck, and tank repair work; for cleaning concrete forms. Also suitable for many wire brushing and grinding operations. Disc diameter: 7". No-load speed: 4200 r.p.m. Overall length: 16¼". Net weight: 11¼ lbs.

See your distributor for complete information or call your nearest SKIL factory branch

EQUIPMENT DEVELOPMENTS

The latest information on manufacturers' developments is presented here with brief summaries of the applications of these products. For new literature giving product information which is available see page 168.

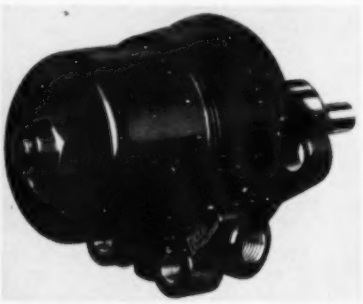
Oil-Fired Winter Air Conditioners

MODEL 2436 oil-fired lowboy winter air conditioners in 85,000, 100,000 and 120,000 Btu capacities — Rheem Mfg. Co., New York. They are equipped with a pressure atomizing type burner and feature the company's "flame-shaped" combustion chamber. Firing into a special stainless steel liner in the combustion chamber, the atomized oil particles are mixed with air and burned in

excellent balance, the company states. The all-steel heat exchanger is electrically welded gastight. Its multisection design is intended to afford large heat transfer area in a compact space and to reduce expansion-contraction noises. The blower and motor assembly is rubber-cushioned. The rubber-mounted burner and the automatic controls are completely enclosed. The unit may be changed to gas firing by replacing the burner with a gas-fired assembly. Access plates in each section of the burner facilitate inspections. AA 1

Fuel Pump for Oil Burners

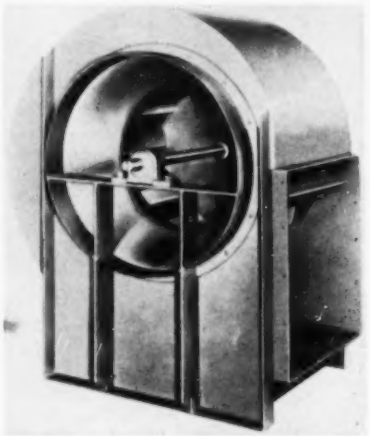
FUEL PUMP for domestic oil burners of the pressure atomizing type, featuring quick cutoff for small capacity as well as larger capacity burners — Delo Screw Products Co., Delaware, O. A valve stem under the strainer cover is provided with two bleed grooves, one designed to bleed off a suitable amount of fuel for small burners and the other the conven-



tional amount for larger capacity burners. Other features include small overall dimensions for a standard capacity pump, and light weight (2½ lb). AA 2

Centrifugal Fan

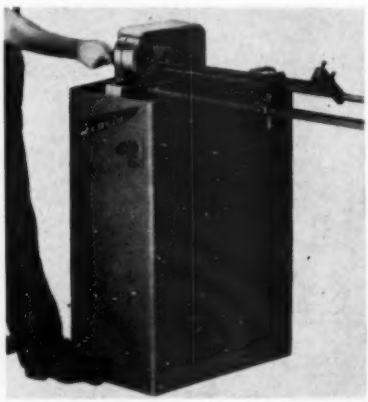
REDESIGNED TYPE A Airfoil centrifugal fan, with a backward curve type wheel which features hollow sectioned blades — Chicago Blower Corp., Franklin Park, Ill. Blades conform to the same aerodynamic principles used on modern aircraft, and operate at efficiencies in excess



of 90 per cent, the manufacturer states. The wheel is designed for quiet operation. The steep pressure characteristic of the fan also makes it suitable for high pressure air conditioning systems, induced and forced draft applications. Fans deliver air at 600 to 750,000 cfm, ⅛ to 16 in. static pressures. Wheels are 12¼ to 132 in. in diameter, adaptable to class 1 through 4 construction. AA 3

Power Rod Parter

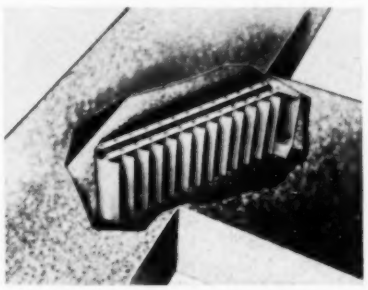
IMPROVED DI-ACRO power rod parter designed for cutting or "parting off" rods and bars of from 1/16 to ⅝ in. diameter, without burr and distortion — O'Neil-Irwin Mfg. Co., Lake City, Minn. Principal improvement in the parter is replacement of an air operated power unit with a motor driven flywheel. The flywheel drive, operating at 180 strokes per minute, is intended to provide six times the cutting speed of the previous model. The new unit can be installed in any



plant where electric current is available, there being no need for air pressure lines, compressors, etc. An Ejectomatic gage, standard equipment, allows the separate operations of gaging, ejecting and cutting to be performed in a single working cycle. Materials are parted off as fast as the operator can feed stock through the cutting heads and engage the foot clutch and short lengths are gaged and cut more quickly than longer ones. The unit occupies a floor space of 17 x 28 in. AA 4

Air Volume Extractor and Controller

MODEL AG-45 air volume extractor and controller designed to save sheet metal men time in assembly work — Titus Mfg. Corp., Waterloo, Ia. It is installed with two screws. It is also made to replace an extra volume



controller, and is adjustable from full-open to full-closed position. The unit, which uses curved blades, turns air from the main duct, and is intended to reduce pressure losses, stop excess turbulence, and to be rattle-free. AA 5

Fittings for Perimeter Heating

COMPLETE NEW line of standardized fittings for small pipe and standard perimeter heating systems — Adelta Mfg. Co., Philadelphia. It includes fittings for 4 in. small pipe, perimeter loop and perimeter lateral warm air systems. AA 6

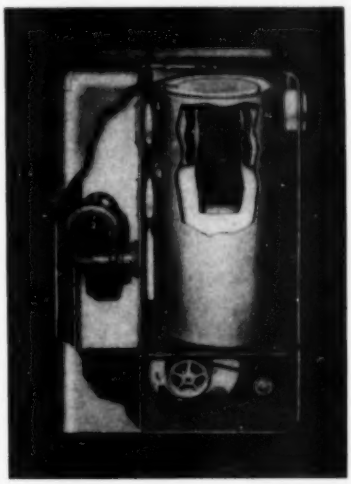
Control for Gas Space Heaters

MODULATING TEMPERATURE control for gas space heaters — A-P Controls Corp., Milwaukee. Designed to fit the company's Model 54 manual Gasapack with automatic safety pilot, the control converts the model to completely automatic operation. No wall thermostat or electric wiring is needed, and installation is accomplished by the removal of four screws, lifting off of the manual-con-

trol name plate, and replacing of it with the modulating control. A vapor-filled thermostatic bulb is used to actuate the control mechanism. When the bulb calls for heat, the control silently snaps the flame on to at least 50 per cent of "high fire." It then adjusts the flame to suit temperature demands, and when correct temperature is reached, the flame is snapped off. AA 7

Oil or Gas-Fired Furnace

MASTER KRAFT convertible furnace, a packaged unit which converts from oil to gas or gas to oil when burners are changed — Harvey-Whipple, Inc., Springfield, Mass. When ordered as an oil-fired furnace, it is 85 per cent assembled, needing installation of the combustion chamber, controls, and flange type burner. When ordered as a gas fired unit, it is completely



assembled. The furnace is enclosed in a 22 gage steel jacket. The oil-fired model is available in sizes of 75,000 and 90,000 Btu per hr at bonnet, the gas fired unit at 80,000 and 105,000 input Btu per hr. AA 8

Electric Drill

THOR COPPER LINE, ¼ in. electric drill, featuring pistol grip operation — Thor Power Tool Co., Aurora, Ill. The tool weighs 2¾ lb, and measures 7⅝ in. in length. Construction features include the handle and field case cast in one piece. AA 9

(Please turn to page 154)

This coupon is for your convenience in obtaining more information about any of the equipment mentioned in this issue.

Keep your record of sources of supply up to date by adding the new products and companies listed here to your January 1953 AMERICAN ARTISAN annual directory section.

FOR YOUR CONVENIENCE

American Artisan 3-53
6 N. Michigan Ave., Chicago 2, Ill.

Please ask the manufacturers to send me full particulars about the equipment mentioned under the following reference numbers in Equipment Developments

(Circle each number in which you are interested)

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32								

Name ..... **Title** .....
Company .....
Address .....
City ..... **Zone** ..... **State** .....

The HIGH-STRENGTH SHEET

is Galvanized Steel

Of all the materials used for ordinary sheet-metal work, steel is the strongest and stiffest.

This means that galvanized steel has less tendency to buckle or kink when it is handled. It usually requires less bracing or stiffening, and can be used in longer sections than sheets made from other metals. Steel sheets also have more resistance to damage from denting or punching.

Bethlehem Galvanized Sheets are made of strong, durable steel, either plain or copper-bearing. Added to this steel is an adequate coating of zinc to guard against corrosion. This combination provides an economical long-lasting material for any kind of sheet-metal work.

When you consider the excellent quality, the low cost and the easy workability of Bethlehem Galvanized Sheets, you can see why they are in constant demand by sheet-metal contractors and fabricators.

Bethlehem
GALVANIZED
Steel Sheets

★ BETHLEHEM STEEL ★

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation
Export Distributor: **Bethlehem Steel Export Corporation**

"I could see the corpsman kneeling over me. The blood plasma was running down through a tube into my arm and he said everything was going to be O.K. I was walking across an enemy mine field in Seoul when one exploded and a piece of shrapnel caught me in the leg.

" 'Got enough of that stuff?' I asked him, pointing to the blood. 'I guess we never have enough,' he said, 'but you can thank *somebody* for this pint.'

"How do you thank 'somebody' for blood? For saving your life? When I got back home, I discovered the answer at my local blood donor center. There's only *one* way to say thanks—by giving some of your own blood."

"How do you thank 'somebody' for Blood?"

Yes, all kinds of people give blood—for all kinds of reasons. But whatever *your* reason for giving blood, this you can be sure of: Whether your blood goes to a combat area, a local hospital, or for Civil Defense needs—this priceless, painless gift will some day save an American life!

Business Executives!
√Check These Questions!

If you can answer "yes" to most of them, you—and your company—are doing a needed job for the National Blood Program.

- ☐ Have you given your employees time off to make blood donations?
- ☐ Do you have a Blood Donor Honor Roll in your company?
- ☐ Have you set up a list of volunteers so that efficient plans can be made for scheduling donors?
- ☐ Have you arranged to have a Bloodmobile make regular visits?
- ☐ Has your management endorsed the local Blood Donor Program?
- ☐ Have you informed employees of your company's plan of co-operation?
- ☐ Was this information given through Plant Bulletin or House Magazine?
- ☐ Has your company given any recognition to donors?
- ☐ Have you conducted a Donor Pledge Campaign in your company?

Remember, as long as a *single* pint of blood may mean the difference between life and death for *any* American . . . the need for blood is *urgent!*

Give Blood Now—Call Your Red Cross Today!

National Blood Program

NOVEL SIDEWALK DISPLAY —

(*Continued from page 78*)

greater diversification. The company bids regularly on new construction, often handling the sheet metal work on several hundred tract houses. It is also increasing its industrial business, with the advantage that business volume is less subject to fluctuations in the building market.

Just how does a sheet metal shop go out after contracts ranging from custom built metal desks to electronics control cabinets? The partners believe that it's simply a question of letting people know who they are and what they can do. So they spend a great deal of time in the field calling on possible customers. But they depend on the mail to carry the main load.

"There are a great many manufacturing firms that don't know where to go for their sheet metal work," Mr. Purpus explains. "For sizeable jobs they must depend on well qualified shops, and they usually find that it's quite a job to locate just the right contractor to fill their needs. That's where our advertising comes into the picture. We don't advertise just to get our name in front of prospects — we also want to do a selling job. With us, advertising is not a necessary evil but an important business tool."

What Direct Mail Can Do

For an example of what direct mail can do in helping a sheet metal contractor, consider the chain of events which was touched off by a form letter which Mr. Purpus mailed out several months ago. The mailing piece explained that the firm was interested in the fabrication of large metal tanks, and brought immediate response from a customer who placed an order for ten tanks to be built to his own specifications. He happened to mention that a friend was looking for similar units.

The customer's friend turned out to be a poultry raiser. He was about to convert his feeding system from sack to bulk feeds and needed a couple of 3-ton farm storage tanks. While Aladdin Sheet Metal Co. was making them up for him, it was learned that there was considerable demand for bulk tanks throughout southern California.

The next step was to design a special tank incorporating all features which poultry ranchers like to have. Then the company went to the poultry association and got that group's approval of its design. It is now manufacturing and distributing these units, and can make them up ahead of time when other work slacks off.

In short, Mr. Purpus and Mr. Cohen follow through to make sure they realize the full potential from every opportunity. That one sales letter packed a selling punch or it wouldn't have attracted the first customer. If he hadn't been satisfied with the work he wouldn't have recommended Aladdin to a friend. And if the partners had not proceeded to develop the additional business they would have lost most of the benefits of their direct mail promotion. It's in that final step that many advertisers in all fields fall down on the job.

Direct Mail Most Important

Aladdin Sheet Metal Co. budgets 5 per cent of its sales volume for advertising. A portion of this goes into a newspaper circulated among industrial plants, and for telephone directory advertising. But most of the money is expended for direct mail. With this medium, a complete sales message can be put across at nominal expense.

Of course a mail campaign is no better than the list of prospects to whom it is directed. It obviously does no good to mail a brochure to a plant which went out of business last year. Instead of buying a mailing list, Mr. Purpus goes through current industrial and telephone directories to make sure he's getting up-to-date names and addresses. He carefully screens each of them so as not to waste circulation among unlikely prospects.

Nor does he expect to get a reply from every circular he sends out. He knows from experience that he can expect about a 2 per cent response, and advertising men will agree that such results mean the money has been well spent. He also finds it advisable to make mailings every few months, since many purchasers may not respond until the second or third time.

Folder Developed

Mr. Purpus has had such good results with the straight letter form of mailing piece that he recently had a folder printed which is more elaborate than anything previously used. Dominating the first of four pages is a drawing of Aladdin's lamp, a trade mark for the company, which appears on the front of the building, on letterheads, envelopes, business cards, statements, and at every possible spot where it can be tied in with the firm name. Thus people learn to recognize it instantly and connect it with sheet metal service.

The folder is mailed flat to give the full impact of the cover design. It was originally intended to have the inside pages show photographs of shop equipment to impress people with the wide variety of work which the shop is equipped to handle. However, it was decided that it would be better to run pictures of sheet metal items already fabricated. The prospect will naturally assume that the firm must have machinery to do any type of work. For those who are interested in equipment details, a complete list of facilities was printed.

Only 2000 of these folders are being sent out in the initial mailing, because if its pulling power proves exceptionally good there could be a deluge of orders which would swamp the shop. A high proportion of the cost of the folders was spent for the necessary art work to insure getting a workmanlike and professional looking job.

This folder is one more step in the company's progressive program for sales punch with follow through.

®AMER-*glas* FURNACE FILTERS

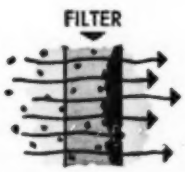
EASY TO HANDLE! EASIER TO SELL!

SELL THE AIR FILTERS YOU'D BUY YOURSELF

New superior design with patented Viscosino adhesive fluid gives maximum filtering efficiency, longer filter life.

Hospital-white—AMER-*glas* filters look clean, outsell other leading brands on eye appeal alone.

Catches "nuisance" dust, holds it inside where it can't pack on the filter face and clog air passages.



AAF backs you with a complete sales pusher kit—everything you need for building interest, building sales, building extra profits.

Here's the filter that's easier, more pleasant to handle—that's easiest of all to sell. Your customers can examine an AMER-*glas* filter any way they like. There are no prickly slivers. And there's no unpleasant odor, or greasy feel. AMER-*glas* filters look clean, feel clean—give you the biggest selling "plus" in the replaceable filter field.

Stock AMER-*glas* filters now, and keep a supply out front for your customers to see. You'll make easy sales, extra profits—build repeat business you can count on three times every year.

You expect the Best from

American Air Filter COMPANY, INC. AAF

AMERICAN AIR FILTER CO., INC.
335 Central Ave., Louisville 8, Ky.

Please send me complete information on AMER-glas Replaceable Air Filters. Show me proof of the profits!

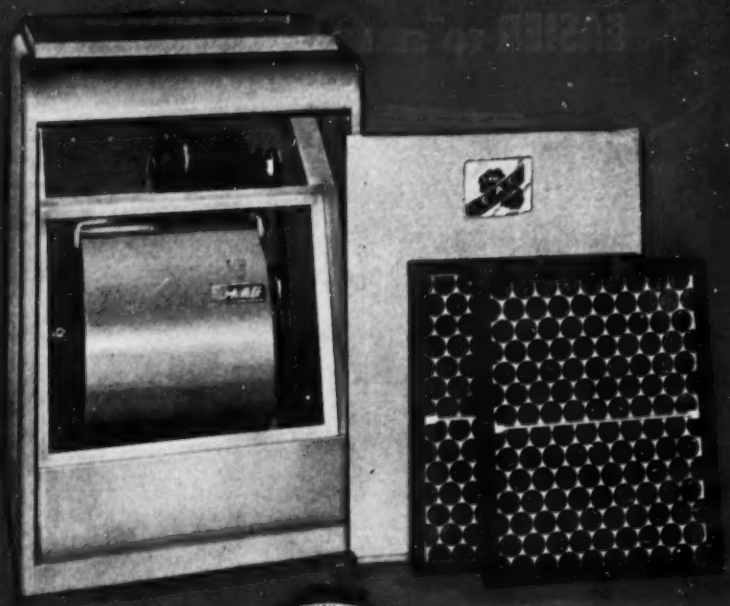
NAME_____ MAIL THIS TODAY

COMPANY_____

ADDRESS_____

CITY_____ ZONE____ STATE_____

So You Want Package Units!



Lau has always been the leading manufacturer of this type unit!

NATIONAL WARM AIR HEATING AND AIR CONDITIONING ASSOCIATION
INDOOR COMFORT

Complete size ranges...to meet *C. A. C. requirements... models 8096, 8106, 8126, 8124

You want smart, attractive design—this is it! Sizes to meet your needs! Compact enough to occupy minimum space! Cabinets are assembled with blowers attached! Easily removable access door! Two oversize filters! Quiet, efficient and economical to operate!

- for furnace sizes 18" to 28" bowl
- c.f.m. 600 up to and including 1800
- most efficient filters on the market
- will accommodate a range of from 66,000 to 196,000 btu/hr bonnet output at 100° temperature rise

***C.A.C.**
These LAU units are built for Continuous Air Circulation. For full explanation of the principles involved in C-A-C please refer to MANUAL 6—from National Warm Air Heating and Air Conditioning Association, 145 Public Sq., Cleveland 14, or write us direct.

Complete Line of Larger Package Units...up to and including 25-inch Blower

THE LAU BLOWER COMPANY • Dayton 7, Ohio

PANEL-CONVECTION—

(From page 67)

the entire length of the building. Fig. 9 shows the location of this slot about 6 in. from the outside wall, as well as a record of temperatures observed on a cold day. The path of least resistance for the warm air was directly into the return air tile rather than upwards through the narrow slot. The air velocities through the slot outlet were of the order of 250 fpm, and the air flow rate through the slot was about 20 per cent of the total rate being circulated through the system.

The data shown in the center of Fig. 9 is comparable with that in Fig. 7 for the closed panel system. The records in Fig. 9 for the panel convection system were for a night in which the outdoor temperature was 8 F at midnight and −8 F at 7:00 a.m. During this period both the burner and the blower operated continuously.

The range of temperatures recorded during this period can be summarized as follows:

Outdoor temperature range was from 8 F to −8 F.

Plenum air temperatures varied from 128 F to 132 F, only a 4 F range.

Slot discharge temperatures varied from 97 F to 101 F, only a 4 F range.

Room air temperatures varied from 70 F to 72.5 F only a 2.5 F range.

Floor surface temperatures near the inside wall varied from 94 F to 97 F. These temperatures were for floor surfaces near the supply air tiles.

Floor surface temperatures near the outside wall (12 in. away from wall) varied from 84 F to 87 F. The variation in floor surface temperature from the inside wall to outside wall was about 10 F.

Modified System More Effective

It is apparent from a study of Figs. 7 and 9 that the modified panel-convection system was much more effective in handling the night-time requirements of the house than was the closed panel system. Unfortunately, complete data was not given for the daytime operation of the panel-convection system under conditions of a large solar load. Due to the magnitude of the solar load in this house with its tremendously large window area on the south wall, it is doubtful whether any heating system will be able to prevent overheating without the addition of outdoor air during the hours of sun load. It seems reasonable, however, that the reduction in the floor slab temperature (as shown by the plenum air temperatures in Figs. 8 and 9) when the closed system was partially opened to the room would result in a smaller "flywheel effect" from the floor slab. This would tend to reduce the amount of overheating in the rooms to some extent.

The importance of this early test lies in the fact that the panel-convection scheme was found to give an improvement over the closed panel

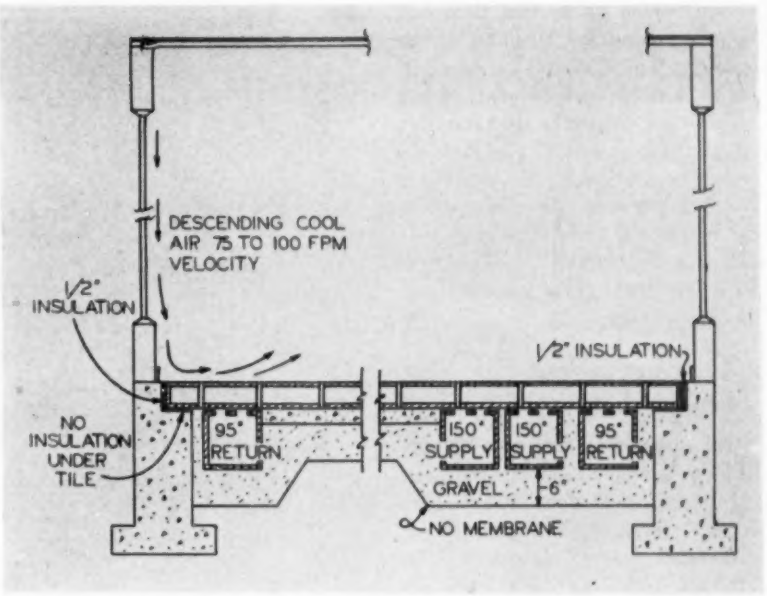


FIG. 8 — COOL AIR DRAFTS from the large glass areas were not eliminated by the closed floor panel system, as can be seen from this cross section showing air velocity patterns at window bases

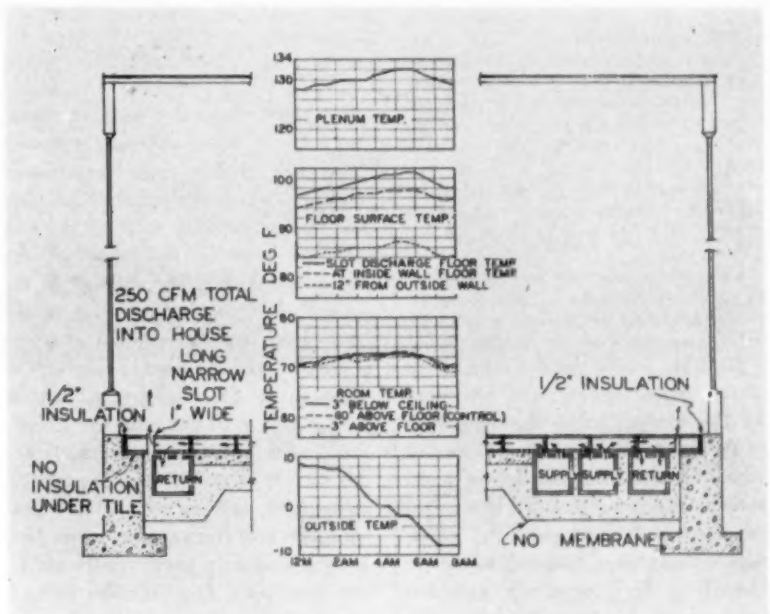


FIG. 9 — A CONTINUOUS SLOT added convection heating to the warm air floor panel system. The temperature records shown were for a night in which the outdoor temperature was 8 F at midnight, -8 F at 7:00 a.m.

system, which up to that time had been attracting the attention of the industry. Later, as will be shown in future articles, the amount of air which was admitted to the room was increased from the 20 per cent obtained in the house described to a full 100 per cent. In other words, the return air duct below the floor slab was omitted, and all the return air was returned to the furnace above the floor level.

Closed Panel and Panel-Convection Systems Compared

The fact that the closed panel system was not able to handle the heating requirements of the house in zero weather was shown in Fig. 7. During the period from midnight to 7:00 a.m. the following facts were observed:

Outdoor air temperature varied from 4 F to −5 F.

Plenum air temperature remained constant at 142 F with burner and blower operating continuously.

Return air temperature through the tiles increased from 85 F to 90 F, indicating that the floor slab temperature was increasing during the period and that the heat emission from the slab was also increasing.

As shown in Fig. 10, the calculated heat delivery to the room increased from about 31,000 Btu per hr to 36,000 Btu per hr.

This rate of heat delivery was not sufficient to handle the requirements, for Fig. 7 shows that the room air temperature did not exceed 63 F during this period.

In other words the delivery of the closed panel system was restricted by the heat emission characteristics of the floor surface. The only way in which the system could deliver more heat to the room was by increasing the floor surface temperature, which was already at a value close to or exceeding the commonly accepted limit of 85 F. It is true that the burner input could have been increased still further, which would have resulted in an increase in plenum air temperature as well as floor surface temperature, and hence in a delivery higher than those shown in Fig. 10 by the broken-line curves. To do so, however, would have increased the possibility of obtaining an unduly warm floor surface.

When only 20 per cent of the circulating air was diverted into the slots,

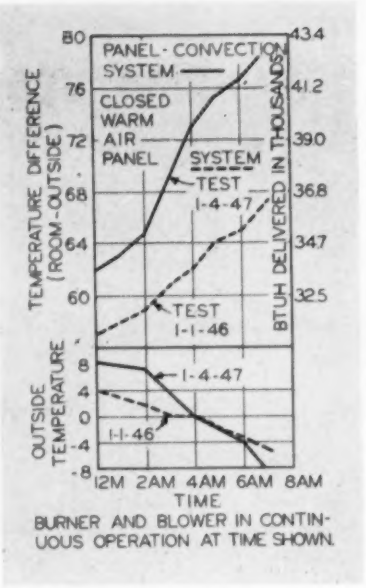


FIG. 10 — THE INCREASE in heat delivery to the room, which resulted when the closed system was partially opened, was between 10 and 20 per cent, with an average of about 17 per cent

the system responded as if the pent-up stresses were suddenly relieved. This was evident from the records in Fig. 9 which showed lower plenum air temperatures in spite of the fact that the room air temperatures were now over 70 F. The delivery of the panel-convection system is shown graphically by the solid-line curve in Fig. 10. The increase in delivery by opening up the closed panel system was between 10 per cent and 20 per cent, with an average of the order of 17 per cent. From a practical standpoint, this meant that the heat emission rate from a panel-convection system was only partly restricted by the maximum floor surface temperature of the order of 85 F. Furthermore, if a given house could be heated with a lower plenum air temperature, as well as a lower floor surface temperature, the "flywheel effect" of the massive floor slab would be diminished. In other words, it appeared at this point that the panel-convection system should retain the desirable characteristics of the closed panel system — excellent room air temperature gradients and warm floor surfaces — without its inherent disadvantages of excessively warm floors, slow response, and poor thermostatic control in changeable weather.

Practical Answer Closer

In reviewing the performance obtained with closed panel heating systems, it is apparent that both ceiling and floor applications did provide warmer floors than was possible with conventional arrangements used in slab floor houses. In fact, panel heating in the floors seemed to overcome the major difficulties accompanying slab floor construction.

On the other hand, the cost of the floor construction and ceiling construction for these closed panel systems was high and served as a detriment to common acceptance for low cost homes. Furthermore, in principle at least, the warm air closed panel system was no different from the floor panel system utilizing hot water coils. With closed panel systems, the temperature controls were often found to be sluggish. That is, the temperature regulation was excellent during prolonged spells of cold weather but was not as good during periods of rapidly changing weather. In many installations the use of a supplementary outdoor control was found desirable in order to anticipate such weather changes. Also, the closed panel system was not completely effective in overcoming the downdrafts of cold air that rolled off large picture windows.

These lessons indicated that further improvements would be possible by modifying the panel heating system and utilizing convection effects to supplement the panel heating effects. This type of system, which has been designated as a panel-convection system, will be discussed in more detail in the next article. As one writer has stated so effectively, the panel-convection system offered "panel heating plus". Thus, the stage was set for the next important step in the development of the warm-air perimeter system.

[Figs. 1 and 2 have been re-drawn by the authors from *Warm Air Ceiling Panel (Closed System)*, American Artisan, July, 1947. Figs. 3 and 5 are courtesy of Permacrete Products Corp. Fig. 4 is courtesy The Clay Products Association, Inc.]

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MICROLITE is non-corrosive, fire-resistant, moisture-resistant; won't support fungi or bacteria; won't provide food for rodents, insects or vermin.

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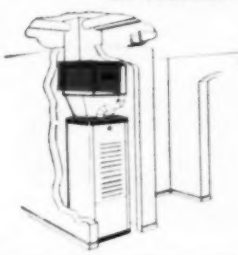
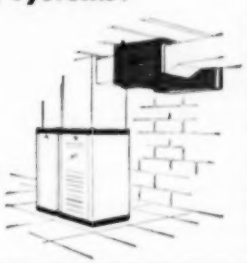


"Flat-Top" Cooling Unit can be installed in closet *above* regular furnace or *underneath* a reverse-flow furnace. (2 or 3-ton sizes)

"Stowaway" Cooling Unit can be installed in ductwork of forced warm air heating systems. (2 or 3-ton sizes)



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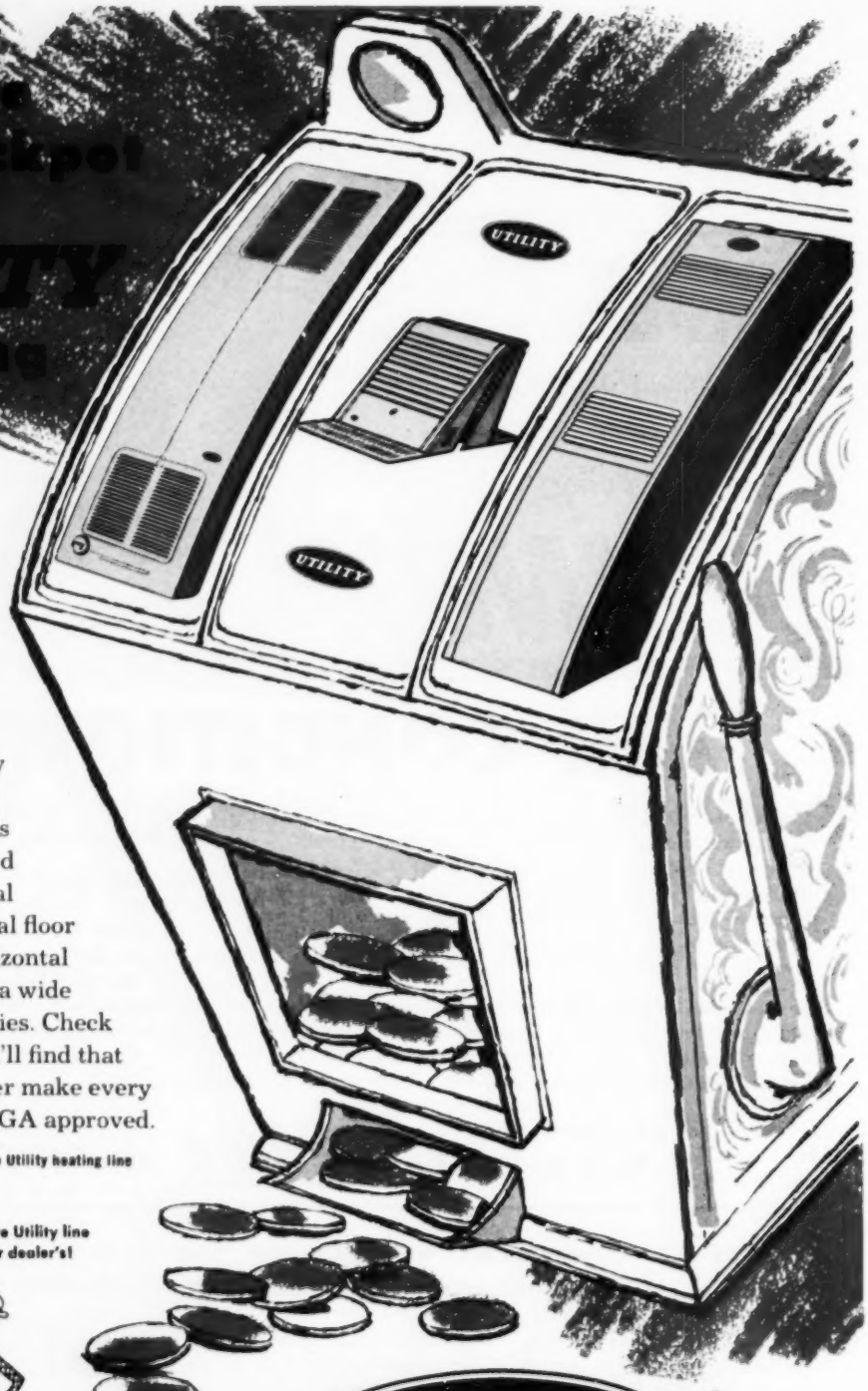

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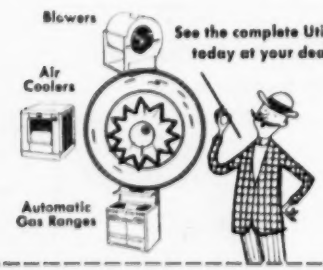

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Please send me FREE literature about the complete Utility heating line.

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Manufacturers of Air Coolers, Blowers and Gaffers & Sattler and Occidental Automatic Gas Ranges

FAN SELECTION —

(*Continued from page 71*)

the calculated and the actual air quantity will depend upon the fan used. Suppose, for instance, our duct system actually has a resistance of 1.5 in. instead of the calculated 1.2 at 1350 cfm. The system curve would then follow the dotted line to the left of the original line and the system curve will balance the fan curves at points *C* and *D* as compared with the original point *A*. It is evident that fan *X*, which has the steepest pressure curve, will deviate the least from the required cfm. It is generally true that for a given duty, a fan of small size, high speed and high outlet velocity will be less sensitive to miscalculation of resistance than is a fan of large size and low outlet velocity.

Before leaving Fig. 5 there is one other point that should be discussed because there is often some confusion concerning it. Inspection of fan curve *Y* shows that at certain resistance pressures it is possible to read three different cfm values. At a resistance pressure of 1.15 in., for instance, one can read cfm values of 610, 900, and 1770. The question arises as to which volume will be delivered if the resistance pressure happens to be 1.15. The answer lies in our previous discussion, where it was shown that the fan must balance the system to which it is applied. The fan never chooses a volume which it will deliver. Rather, the volume is determined by the relation of the system characteristic to the fan characteristic as illustrated by the intersection of the system and fan curves on Fig. 5. Thus, the fan on Fig. 5 could deliver each of the three air quantities listed above against a resistance of 1.15 in. only if that air quantity and resistance pressure happened to fall also on the characteristic line of a duct system.

It should be remembered that the characteristic curve of a duct system remains unchanged only so long as dampers and deflectors remain fixed and filters remain clean. Any change in damper settings for winter-summer operation or any collection of dirt on the filters with the passage of time will alter the system curve and create a new balance with the fan curve.

Many Factors May Cause Fan Noise

Noise in fans is not a function of speed and velocity alone, but is caused by a combination of outlet velocity, tip speed, air passage dimensions, and workmanship. Noise in a system may originate from bearings, unbalance of rotating parts, misaligned or unbalanced drive, poorly designed motors, loose connections, improperly designed dampers, improperly selected grilles, poorly designed transitions, and many other causes.

In residential air conditioning, care must be exercised to avoid noise, since it is often necessary to circulate a different quantity of air for heating than for cooling. There are a number of ways to vary the amount of air. For infrequent changes, perhaps no more than one change per season, the fan speed may be changed by changing the fan or motor sheave or by varying the pitch diameter of an adjustable motor sheave. A second method is to provide dampers in the duct which can be moved into position to add resistance to the flow of air, thereby cutting down the quantity. A third method is to provide adjustable inlet vanes for the fan, and a fourth, to provide a variable speed drive or transmission to change fan speed. Last but not least, variable speed fan motors can be used.

For residential use, where fan motors are small and power requirements low, the damper method is perhaps the most satisfactory, although the methods whereby fan speed is reduced will provide the most efficient means for volume control. Seasonal changing or adjusting of sheaves can be done by the service man when he calls to inspect, clean, and adjust systems. The variable speed drive or transmission and the variable speed motor are relatively costly and cannot usually be justified unless frequent speed changing is needed. Inlet vanes save some power, while dampers save the least.

Fan Motors Compared

Fan selection almost always involves the selection of a fan motor. No discussion about fans, therefore, is complete without some information about the motors which are used to drive them.

Fans, in general, fall into a class of equipment which requires a relatively low torque for starting. Actual resistance to starting is a function of bearing friction and inertia, since the fan has no load on it when it is not running. Alternating current motors for fan application can be either single phase or polyphase. When polyphase current is available it is usually more economical to select polyphase motors since they are not only smaller and have a lower first cost, but they also have a higher power factor and efficiency and are, therefore, more economical to run. Single phase motors often require centrifugal starting switches which may in time cause service problems.

Single phase motors are usually classified by the method used to start them. Some of the more common ones suitable for fan application are:

1. Split phase. These motors are started by a high resistance auxiliary winding which is disconnected through a centrifugal switch as the motor comes up to speed. They are used extensively for fan motors but are available only in fractional horsepowers — usually 1/3 hp and below. Starting torque and starting current are normal.

2. Capacitor start. These motors have a starting winding connected in series with a capacitor. A centrifugal switch is used to disconnect the starting winding and capacitor. High starting torques are developed in the smaller sizes.

3. Permanent split capacitor. These motors are similar to the capacitor start motor except that the capacitor is not cut out when running. Available only in fractional horsepowers, these motors with their low starting torque are very popular for small fan drives.

The most common type of fan motor for polyphase current is the squirrel cage motor. Squirrel cage motors are available with different characteristics in accordance with the class, A, B, C, or D, for which the motor was designed. Class A and B motors are most frequently used for fans since both have normal starting torque. Class B motors have somewhat less starting current than have

class A motors. Class C motors have high starting torque not often needed for fans, and class D motors have high slip for use on pulsating loads.

Two other types of polyphase motors are available: the wound rotor and the synchronous. Wound rotor motors are essentially high torque motors and are not often needed for fan drives. Synchronous motors are constant speed motors having high efficiency and variable power factor. They are often used in conjunction with other plant equipment to improve the plant power factor. Fan application is not unusual.

In general, motors should be sized at least 20 per cent higher than fan estimated brake horsepower to provide a margin for changes of fan speed in the field. Service factors of 1.15 on motor loading apply for most motors. Sleeve bearing motors should be chosen, as ball bearing motors tend to become noisy with use.

Many Factors Affect Selection

In summary, the proper selection of a fan and motor involves the following considerations:

1. A load calculation to determine air volume requirement.
2. An accurate estimate of the resistance of the duct system.
3. An evaluation which balances fan cost and space against noise level and efficiency. A large fan running at slow speed will cost more initially, and take up more space, but will cost less to run, and be less noisy than will the small fan running at high speed for the same duty.
4. A consideration as to the effect of miscalculation or summer-winter system rebalance on air delivery. Because of its steeper pressure characteristic, the higher speed fan, while having less deviation from design air quantity due to miscalculation, is not as suitable as a slower speed fan with its flatter pressure curve when volume controls are used. Throttling air quantity on fans with steep pressure curves causes a very sharp pressure increase with resultant noise from air whistling through dampers. Throttling of air on fans with flat pressure characteristics causes a reduction in air quantity with little pressure change.
5. An estimate of horsepower requirements. The forward curved blade fan has a characteristically increasing horsepower curve with a reduction of resistance. If the fan is used on a system where bypassing is used without a compensating speed change or damper throttling, motor overloading is a possibility. Select motors for at least 20 per cent more horsepower than estimated requirement.

For residential work where an air conditioner is to be added to a warm air heating system it is necessary to estimate fan and motor capacities to determine whether or not they are ample to handle the cooling air quantity against increased system resistance. Tables 1 and 2 can be used as sort of rule-of-thumb figures for estimating purposes. Cooling installations usually require from 400 to 500 cfm per ton.

TABLE 1—FAN SIZES supplied with furnace for operation against 0.2 in. water duct resistance

Fan dia. double width double inlet	Max. cfm handled quietly
9	800
10	1200
12	1800

TABLE 2—COMMON motor selections

Unit tons	Min. fan motor
1	1/6
2	1/4
3	1/3
5	1/2
7½	3/4

INSTALLING CEILING DIFFUSERS —

(Continued from page 73)

500 fpm inlet velocity for heating and 700 fpm for cooling. Therefore, the selections we made for heating were also ideal for cooling because when cooling is added, the fan capacity is generally increased by about 25 per cent. The pressure drop through the diffusers is 0.01 in. water gage at 500 fpm.

The diffuser sizes automatically determine the size of the prefabricated round ducts which run out to each diffuser. The take-off diameters of the diffusers are the same size as the diameters of standard round branch pipe.

The total air quantity handled by the round branch pipes determined the size of the horizontal extended plenum as shown in the floor plan. The vertical plenum which comes up through the house from the furnace in the basement is 24 x 24 in.

The owner wanted to be able to use his attic for future expansion. We located the furnace in the basement so that the vertical plenum would come up in the eave space in the attic. This plenum was run up the back of the front hall closet as shown in the floor plan.

In the attic, we branched off on each side of the vertical plenum with the horizontal extended plenums shown. These were run entirely in the eave space. The prefabricated round ducts which run out to each diffuser were laid between the joists and were subsequently covered over by the attic floor. All exposed ducts were covered by ½ in. wrap-around insulation. To make the take-off from the round duct to the diffusers, which were to be floored over, we used a boot fitting. For the other diffusers we simply used 90 deg elbows.

Where one diffuser is used in a room, it is always located in the center of the ceiling. If the room is long, with one side more than 1½ times the other, we use two diffusers. See the living room shown in the floor plan.

Return Air System Described

There are five 30 x 4 in. return air grilles in the locations shown on the floor plan. In northern climates, where the return air system is as important as the ceiling diffusers, the returns should be located on outside walls under the largest glass areas so that they will collect and remove the cold air before it can get into the room. We "panned" basement joists where possible.

In the diffuser we use on our jobs, the air enters through the take-off duct connection and is deflected by a bottom deflector plate which spreads the air horizontally into the room in a 360 deg pattern. The diameter of the outlet opening is twice the diameter of the take-off opening. This gives a much greater surface for the supply air to mix with the room air.

[Photos courtesy W. B. Connor Engineering Corp.]

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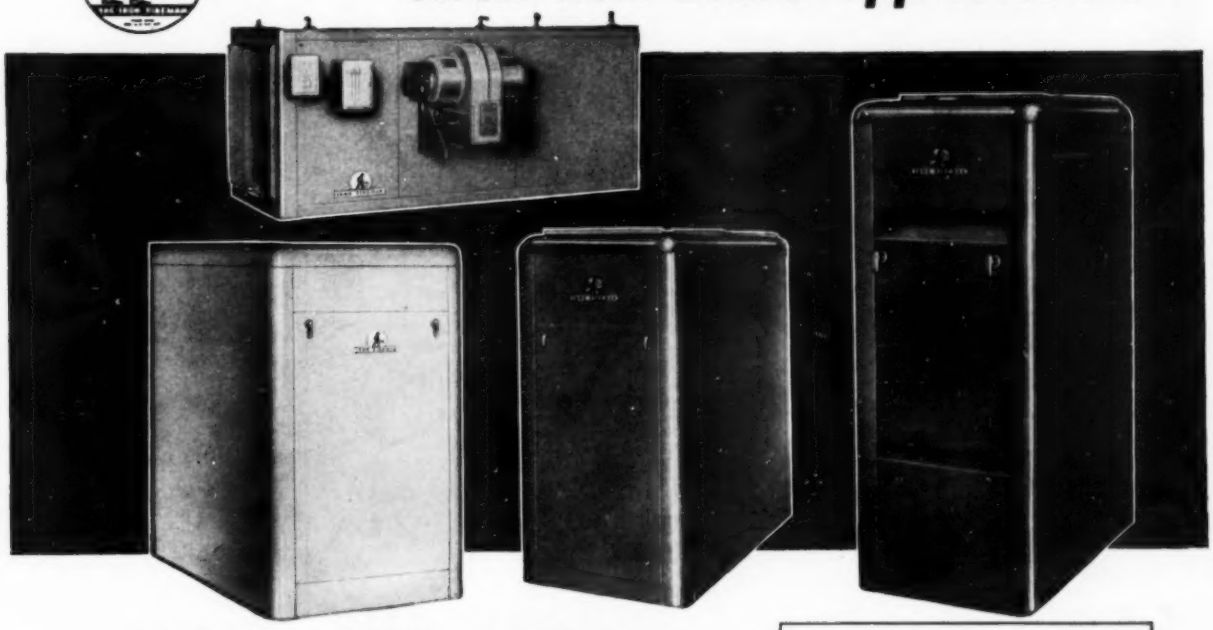

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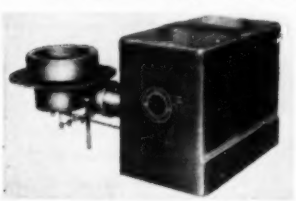
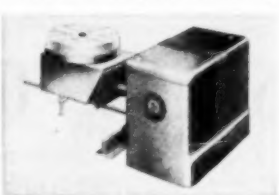
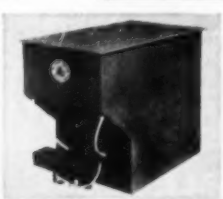


OIL CONVERSION



GAS CONVERSION



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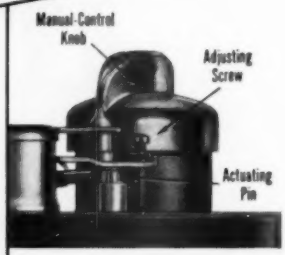
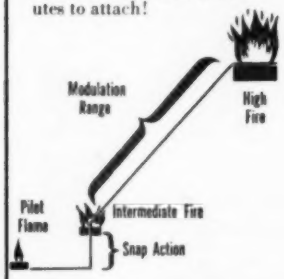


The exclusive actuating pin, found only on A-P oil valves, permits quick, easy attachment of the Comfort Control. The control fits right over the name plate . . . fastens with two screws . . . takes less than 5 minutes to attach!



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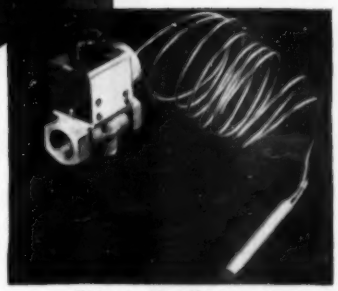

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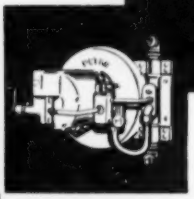

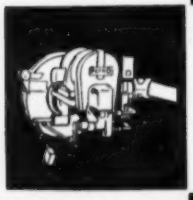

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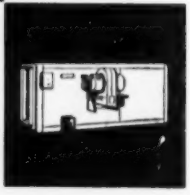

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MAKING A Y BRANCH —

(Continued from page 74)

628.5 sq in., which is equal in area to a 28 in. diameter pipe. The allowable clearance between the conveyor and the building beam is 20 in. Shown on Fig. 9 is an oval which has a 10 in. radius on each end. The sum of 10 in. radii is equal to a 20 in. diameter pipe which has an area of 314 sq in. Subtracting the area of a 20 in. pipe from the area of a 28 in. pipe is 616 minus 314, or 302 sq in. 302 sq in. divided by 20 in. equals approximately 15 in. This will be the length of the straight line between the radii of the oval.

The Simplified Method Drawing:

A study of the plan view, Fig. 3, and the front view, Fig. 4, will show that the fitting is symmetrical about both center lines. From this analysis it is evident that all the drawing necessary to develop the pattern is one-half front view as shown by Fig. 5.

The following is the step by step procedure of the pattern problem solution.

To Construct the Simplified Method Drawing Marked Fig. 5:

a) Draw the horizontal line marked 20-23, which is 2 in. From point 20 measure 1 in., mark the point R′ and through the point draw the vertical center line marked CL.

b) From point R′ measure 1 in. on the vertical center line and through this point draw the 45 deg center line marked CL. On this line measure 2 1/16 in. and mark the point O′. Through point O′, draw a line parallel to line 20-23; measure ¾ in. on both sides of point O′ and mark the points 1,1′.

c) From O′ draw a line perpendicular to line 1-1′ and mark the center line CL. From point O′ measure ⅜ in. and mark the point O″. From points 1,1′ draw lines perpendicular to line 1-1′. From point 1 measure ½ in. and mark the point 9″. Draw a line through points 9″,O″ to intersect the perpendicular line drawn from 1′.

d) From points 1,1′, measure ¼ in. and from these points as centers draw 90 deg arcs. Through the tangents draw a line connecting the arcs. Divide the 90 deg arcs into three equal spaces and through the points draw lines perpendicular to line 1-1′. Mark the lines 2, 3, 4, as shown. Extend these lines to intersect the miter line and mark the lines 9, 10, 11, 12, 13, 14, 15, and 16.

e) With point R′ on line 20-23 as center and radius R′-23, draw a half circle. Divide the half circle into six equal spaces and through the points draw lines perpendicular to and intersecting line 20-23.

f) From point 16″, draw a line at 60 deg to the vertical center line and mark the point 26. With R′-26 as radius draw a 90 deg arc, divide the arc into three equal spaces and through the points draw lines perpendicular to and intersecting the center line marked CL. Extend the vertical lines drawn from the three equal spaces of the 90 deg arc 23-23, to intersect the horizontal lines at points 23, 24, 25, 26. Through the points draw the outline of the crotch.

g) From the intersection points of the perpendicular lines on lines 9″-16″, and R′-26, R′-20, draw work lines Z, Y, X, W, V, U, M, N, P, Q, R, S, T.

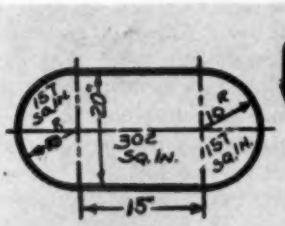

FIG. 9—OVAL SIZE is determined by the allowable clearance

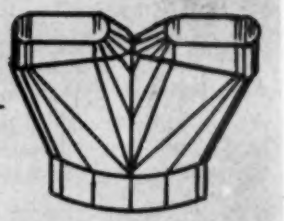

FIG. 10—PICTORIAL VIEW of the completed transition

To Develop the Collar Pattern Marked Fig. 6:

a) Calculate the collar stretch-out by adding the radii, multiplying the sum by 3.14 and adding twice the straight section. Thus [(¼ + ¼) × 3.14] + (2 × 1 in.) = 0.5 × 3.14 + 2 in. = approximately 3¾ in.

b) Draw a 3¾ in. horizontal line. Beginning at one end measure 7/16 in., 1 in., ⅞ in., 1 in., and 7/16 in. Divide the 7/16 in. sections into three equal spaces and the ⅞ in. section into six equal spaces. Through the points draw lines perpendicular to the horizontal line.

c) From Fig. 5 transfer lengths 16, 15, 14, 13, 12, 10, 9, to the corresponding lines on the layout and through the points draw the pattern outline. Mark the intersection points on the developed line 16′, 15′, 14′, 13′, 12′, 11′, 10′, 9′.

To Develop the Pattern for One Leg Marked Fig. 7:

a) Transfer the line marked true length line from Fig. 5 to a vertical line and mark the line 20-9′.

b) Draw a right angle. Transfer line Z from Fig. 5 to the vertical line and rise 2 on the ¼ in. radius on Fig. 5 to the horizontal leg. The line 2-Z is the true length line. With line 2-Z as radius and point 20 on Fig. 7 as center, draw arcs. Measure arc 9′-10′ on Fig. 6 and with 9′ on Fig. 7 as center, cut the arc 2-Z and mark the points 10′.

c) Transfer line Y, Fig. 5, to the vertical leg of a triangle. Using a compass, measure length 2 on the ¼ in. arc at the oval end and subtract this distance from the distance marked B on half circle at the round end. The rise marked G is the horizontal leg of the right angle and the hypotenuse Y-G is the true length line. With length Y-G, as radius, and points 10′ on Fig. 7 as centers draw arcs. With arc 20-21, on Fig. 5 as radius and point 20 on Fig. 7 as center, draw arcs to cut arcs Y-G, and mark the points 21.

d) Line X is transferred from Fig. 5 to the vertical leg of a right angle. Measure length 3 on the ¼ in. arc at the oval end and subtract this distance from distance B on the half circle at the round end. The rise marked

H is the horizontal leg of the right angle and the hypotenuse H-X is the true length line. With H-X as radius and point 21 on Fig. 7 as center, draw arcs. With arc 10′-11′ on Fig. 6 as radius and point 10′ on Fig. 7 as centers, cut the arcs HX and mark the points 11′.

e) On a right angle, length W is transferred from Fig. 5 to the vertical leg and the rise distance J, shown on the half circle at the round end, is transferred to the horizontal leg. The hypotenuse marked W-J is the developed line. With W-J as radius and points 11′ on Fig. 7 as center, draw arcs. Set a compass at arc 21-22 on the Fig. 5 half circle and with point 21 on Fig. 7 as center, cut arcs W-J and mark the points 22.

f) Transfer line V from Fig. 5 to the vertical leg of the triangle. Using a compass, measure length 4 on the ¼ in. arc at the oval end and subtract this distance from the distance marked C on the half circle at the round end. The rise marked K will be the horizontal leg of the right angle and the hypotenuse K-V is the true length line. With length K-V as radius and points 22 on Fig. 7 as centers, draw arcs. With arc length 11′-12′ on Fig. 6 as radius and points 11′ on Fig. 7 as center, cut arcs K-V and mark the points 12′.

g) Subtract distance 4 on the ¼ in. arc on Fig. 5 at the oval end from distance D on the half circle at the round end and mark the difference L. On a right angle, transfer length U and rise L from Fig. 5 to the horizontal and vertical legs of the right angle and mark the hypotenuse L-U. With L-U as radius and points 12′ on Fig. 7 as centers, draw arcs. With arc length 22-23 on Fig. 5 as radius and points 22 on Fig. 7 as centers, cut arcs L-U and mark the points 23.

h) Working from Fig. 5, make length M and the difference between line 4 on the ¼ in. radius and D on the half circle (which is equal to L) the horizontal and vertical lengths of the right angle. Hypotenuse L-M is the true length line. With L-M as radius and points 23 on Fig. 7 as centers draw arcs. With length 12′-13′ on Fig. 4 as radius cut arcs L-M; mark the points 13′.

j) Subtracting length 3 on the ¼ in. oval end from distance CL-23 on the developed crotch end will give the rise distance O. Transferring length N and rise O from Fig. 5 to the horizontal and vertical legs of a right angle will give the true length line O-N. With O-N as radius and points 23 on Fig. 7 as centers, draw arcs. With length 13′-14′ on Fig. 6 as radius cut the arcs O-N and mark the points 14′.

k) From Fig. 5, transfer length P to the horizontal leg of a triangle, and the difference between line 3 on the ¼ in. oval end and line CL-24 (equal to E) to the vertical leg. Hypotenuse E-P is the true length line. With E-P as radius and points 14′ on Fig. 7 as centers draw arcs. With length 23-24 on Fig. 5 crotch as radius, cut arcs E-P and mark the points 24.

l) On Fig. 5, distance 2 on the ¼ in. oval end subtracted from line CL-24 will give the rise distance XX. Length XX will be the horizontal leg of a right angle and length Q, the vertical leg. The hypotenuse XX-Q is the true length line. With XX-Q as radius and points 24 on Fig. 7 as centers, draw arcs. With length 14′-15′ on Fig. 6 as radius, cut arcs XX-Q and mark the points 15′.

m) Draw a right angle. Transfer length R from Fig. 5 to the vertical leg. With a compass, measure length 2 on the oval end and subtract this from length YY at the crotch. The difference F is the horizontal leg and the hypotenuse F-R is the true length line. With F-R as radius and points 15′ on Fig. 7 as centers, draw arcs. With length 24-25 on Fig. 5 as radius cut arcs F-R and mark the points 25.

n) Transfer length S from Fig. 5 to the vertical leg of a right angle and length YY to the horizontal leg. The hypotenuse YY-S is the true length line. With points 25 on Fig. 7 as center and YY-S as radius, draw arcs. With arc length 15′-16′ on Fig. 6 as radius and points 15′ on Fig. 7 as centers, cut arcs YY-S and mark the points 16′.

p) With true length line T on Fig. 5 as radius and points 16′ on Fig. 7 as centers draw arcs. With arc length 25-26 on Fig. 5 as radius and points 25 on Fig. 7 as centers, cut arcs T and mark the points 26.

r) Through the developed points draw the required worklines and the pattern outline and add allowances for seams and joints.

CONTRACTORS MEET —

(*Continued from page 96*)

president, R. W. Friday, Rochester; second vice president, F. V. Pils, Lockport; treasurer, W. C. Kirkpatrick, Buffalo; executive secretary, C. J. Meyer, Buffalo.

Directors for three years are W. R. Nolder, Buffalo; P. L. Sullivan, Binghamton; I. O. Spalty, Rochester. Directors for two years are Jos. Cashier, Syracuse; C. R. Joyce, Jr., Albany; and R. B. Millard, Scotia. Directors for a one year term are Stanley Bates, Rome; W. C. Schmitt, Rochester; and Peter Sturr, Utica.

At the last session of the meeting, a trophy was awarded to the local organization with the largest representative attendance. A guest from Toronto, Canada, Mr. Rogers, made the presentation to W. C. Schmitt, Jr., president of the Rochester association.

The association's auxiliary, the Merchandisers Association, elected as officers: president, C. F. Villnow, Revere Copper & Brass, Inc.; first vice president, Carl Boyd, Heating Supply Co.; second vice president, P. W. Lane, John B. Davie Co.; third vice president, T. E. O'Neal, Follansbee Metal Warehouses; treasurer, G. F. McCrary, Inland Steel Products Co.; secretary, Raymond Bolton, Follansbee Metal Warehouses; sergeant-at-arms, S. H. Perkins, Minneapolis-Honeywell Regulator Co.

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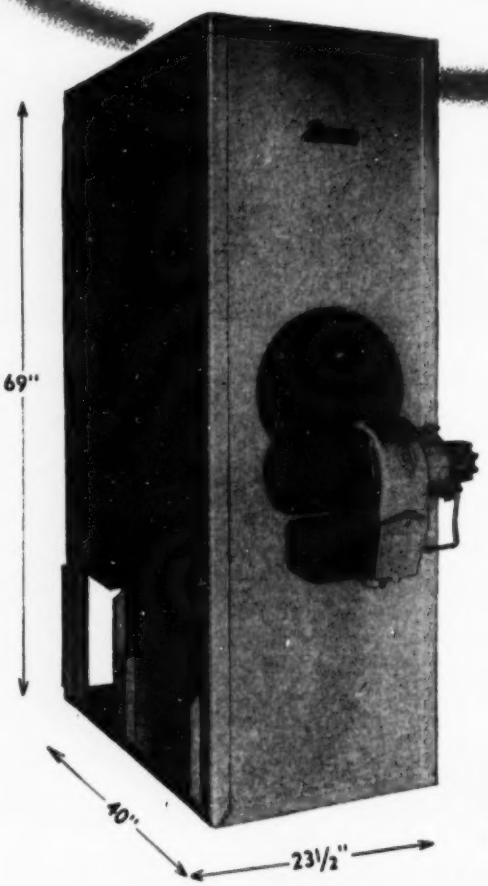


COMPACT all-in-one UNIT
only 6½ sq. ft. of floor space
69" height includes built-in plenum

If the crowds at our Chicago Show Booths prevented your seeing this sensational addition to our line (or if you were not there), write or wire for details.

Circulating Warm Air Heat

75,000 b.t.u. rating

***PLUS* year round domestic HOT WATER SUPPLY**

All in ONE compact UNIT

Dependable, economical Gun Type Oil Burner

30 Gallon Extra Heavy Galvanized tank with Magnadur rod

Heavily insulated Jacket — 4 controls

Air filters Extra Heavy Heat Exchanger

2" Thick High Temp Combustion Chamber

Shipped fully assembled, crated, ready to install

Priced to meet the most competitive separate furnace and hot water heater installations

Cuts installation costs in half

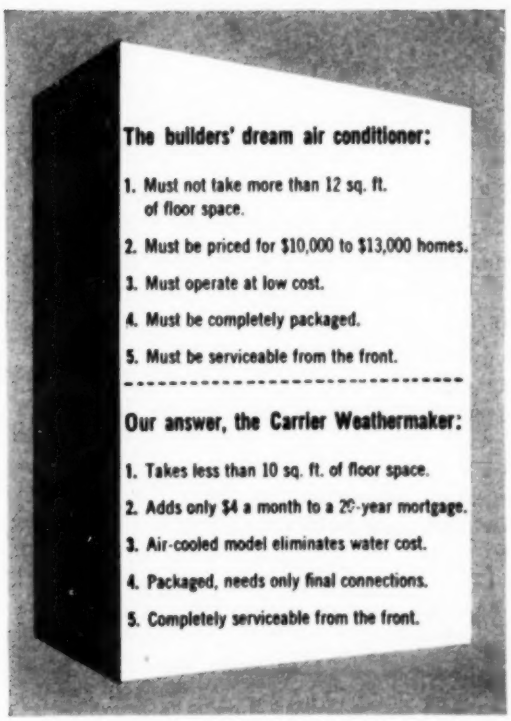
METROMATIC [illegible]

EVERETT 49, MASSACHUSETTS

Desirable franchises available to preferred dealers
Write Dept. AA 11

NEW CARRIER WEATHERMAKER IS PRE-SOLD TO BUILDERS

...and there are opportunities available right now to sell this wonderful new year-round air conditioner!


The builders' dream air conditioner:
1. Must not take more than 12 sq. ft. of floor space.
2. Must be priced for $10,000 to $13,000 homes.
3. Must operate at low cost.
4. Must be completely packaged.
5. Must be serviceable from the front.
Our answer, the Carrier Weathermaker:
1. Takes less than 10 sq. ft. of floor space.
2. Adds only $4 a month to a 20-year mortgage.
3. Air-cooled model eliminates water cost.
4. Packaged, needs only final connections.
5. Completely serviceable from the front.

Back a few months ago, the merchant builders got together and told us (and every other air conditioning manufacturer) what they wanted if we expected air conditioning to break into the $10,000 class of home — and sell 300,000 additional houses a year!

Today — we've got the air conditioner they asked for — the new Carrier Weathermaker! But the market is so all-fired big that more dealers are needed to sell and install the Weathermaker.

That means *you*. But don't delay! Rush the coupon today!

Carrier

AIR CONDITIONING • REFRIGERATION • INDUSTRIAL HEATING

CARRIER CORPORATION
308 S. Geddes Street, Syracuse, New York

I want to sell that wonderful new Carrier Weathermaker. Please send me the name of my nearest Carrier distributor.

*Name*_____

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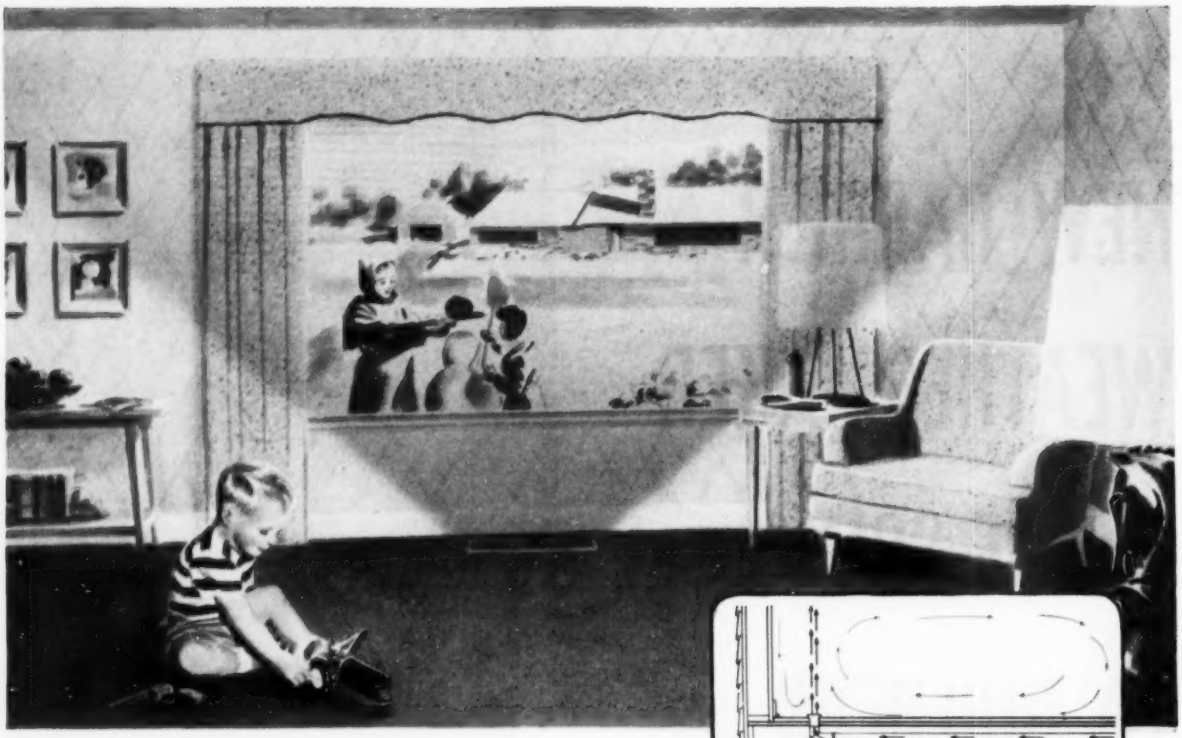
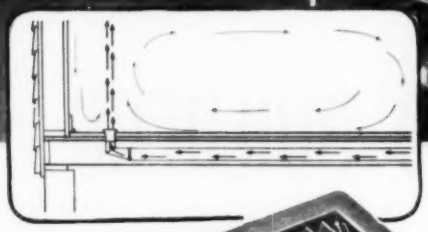
*City*_____ *State*_____

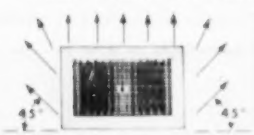




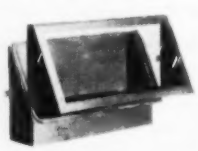
here's how the *Lima* floor diffuser assures you of proper air distribution in perimeter heating

It Must Be Better — To Be So Widely Copied

Originally developed by Lima engineers and still the finest, the Lima Floor Diffuser *does the complete job* of proper air distribution in perimeter heating systems. It diffuses a fanshaped blanket of warm air at reasonably high velocity to stop cold air in critical areas . . . *and* . . . it pulls air from within the room into circulation. This induced air circulation is so perfect that the constant aspiration of air is comfortable and complete without being noticed. The Lima Standard 2"x14" size is particularly recommended in perimeter heating. Other sizes include 2"x12", 4"x10", 4"x12", 4"x14". Ask your wholesaler or write direct for literature today.

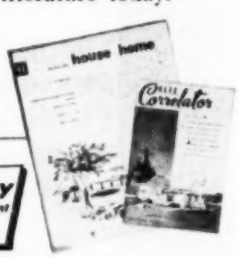


New Lima "45" Wall Diffuser for perimeter heating, where sidewall or baseboard outlets are preferred. Diffuses warm air upward and to all sides, starting at 45° angle from floor and extending over a 90° spread. The 20-22½° diffusion angle away from wall eliminates smudging . . . assures correct 70° angle upward from floor.



Lima WALL-O-WAY Stackhead and Frame simplifies out-of-the-wall installations in old house or solid wall construction. Use them in combination with the new Lima "45" Wall Diffuser or Lima Standard Wall Register.

nationally advertised to architects and builders



Lima **Register Company**
World's Finest Diffuser and Register Plant
LIMA, OHIO

sold exclusively through heating wholesalers and manufacturers

CONTRACTORS TALK —

(*Continued from page 84*)

some other means, but that, contrary to many opinions, this type of heating system was not easier to lay out than conventional systems. His recommendations were, "Use the small duct system wherever you can, but use it correctly".

Mr. Redrup continued his comments on perimeter heating by reporting that the original resistance of the housewife toward floor registers was fast disappearing, especially now that registers blend so well with the floor covering and provide excellent heat distribution. He also mentioned a number of large buildings which were completed last fall in which warm air perimeter heating systems were used. Throughout this winter, each of these systems has provided excellent comfort conditions and has proven that the field open to perimeter heating is practically unlimited, he said. The buildings named were a school house, a factory, and an office building.

Mr. Redrup believes that each heating dealer should try to influence architects to specify perimeter heating for more year 'round applications. Forced warm air systems can easily be adapted to provide all three functions required for comfort: heating, cooling, and ventilation. He stated that he was happy to report that the entire industry is working together to achieve better products and more effective ways of doing the job of providing year 'round comfort. It is this spirit of cooperation in the face of competition that makes the industry unique in its development, he said.

One point frequently overlooked by the home builder is the importance of the heating plant in the home, and Mr. Redrup suggested that the heating dealer should not let up in his campaign to influence the builder to provide more room for the furnace so that it may be properly serviced. He recalled one home in which the domestic hot water tank had to be disconnected and moved to permit the furnace repair man to adjust the fuel burner. The heating system is the most important single piece of equipment that goes into a home and should receive the consideration it deserves, he pointed out. The only way to obtain recognition of this is to remind the builder and to make suggestions that will enable him to provide the space needed.

Adding Summer Cooling

Year 'round air conditioning was discussed by Art Gilkerson, Meyer Furnace Co., who outlined the progress made in packaged cooling equipment and described how to select the correct size equipment for individual applications. He pointed out that sizing ductwork to suit the needs of a heat supply in the winter did not always provide adequate quantities of air for summer cooling. However, he said that people are a lot less critical to variations in room temperatures in the summer than they are in the winter. Often there is as much as a 5 deg difference between room temperatures in the summer, due to the exposure of the building to the sun load, but occupants seem to be satisfied if the moisture content of the air is kept at a reasonable level. This can be achieved easily if load estimating is given due consideration at the time of selecting the equipment.

Mr. Gilkerson said that summer cooling enjoyed a sudden and rapid acceptance in 1952 because of the unusually hot summer and because home builders realized that the demand for homes would not continue at the rate of 1,000,000 units annually unless people could be interested in selling their old homes and buying new ones. The incentive for this was summer cooling, which offered something extra without materially increasing the cost of the building. He pointed out that summer cooling permits the builder to make certain savings in the erection of the building itself, such as in window location, room arrangement, and the use of solid walls in the place of walls allowing for ventilation requirements. All of these features plus summer cooling will help the builder to merchandise these houses in a buyer's market and help him retain his dollar volume.

"Estimating approximate prices of installed equipment in various sizes and styles of homes is a difficult problem to attempt", said Mr. Gilkerson, "but in general, homes in a price class of $50,000, using wet heat systems, could have ductwork installed with summer cooling equipment for between $8000 and $15,000. The size equipment required in a home of this size would be between 8 and 10 tons of cooling.

"In the $35,000 ranch style home heated with a warm air system, a 5 ton unit could be installed for about $1500. This would include the cost of piping water for the condensing medium and the electrical wiring costs. In a medium priced home ($15,000 group) a 3 ton unit could be added for about $1200."

Mr. Gilkerson said that his company obtained sales leads in three main ways. Sixty per cent of the inquiries came from people who were interested in summer cooling and had asked neighbors whom they recommended; 25 per cent came from architects who asked for bids based upon the plans submitted; and 15 per cent came from people who had indicated to others that they were interested in obtaining summer cooling equipment for their homes.

Discusses Cooling Installation Problems

Colored slides of installed cooling equipment were shown, and the installation problems were pointed out and explained. One very interesting problem was solved by cutting an opening in the side of the furnace above the blower housing chamber, and attaching a duct to permit the cooling equipment to be placed in the return air system. A damper arrangement permitted the return air to either pass through or bypass the cooling equipment.

Commenting on the various steps necessary in making cooling installations, Mr. Gilkerson advised that all equipment should be selected only after a careful estimate is made and that the new Manual 11 of the National Warm Air Heating and Air Conditioning Association

will include estimating forms for both new buildings and existing homes. He also said that it is advisable to insulate any ductwork in the basement if there is condensation forming at any time. If no condensation appears, insulating is not necessary. However, when the ductwork is located in the attic, it is a "must" that insulation be installed, because the warm attic air will heat the conditioned air within the duct to a point where it will be ineffective when it enters the room below.

A most important pitfall for the heating dealer to avoid is giving a guarantee of the temperatures to be achieved. Mr. Gilkerson said that comfort is what people are interested in. It can be provided with the equipment in use today, but mentioning the temperatures to be expected may make the customer too critical of the relation between temperature and comfort. Many people fail to realize that humidity is just as important as temperature to comfort and that many combinations of temperature and humidity result in the same comfort conditions.

"I have never known of a customer who wasn't glad he had bought summer cooling equipment for his home", said Mr. Gilkerson. "Today the heating dealer must offer cooling equipment as well as heating equipment if he wishes to keep his customers. If he doesn't offer cooling equipment, the customer will take all of his business to someone who does."

Officers elected at the meeting to serve for 1953 are: H. M. Daily, president; T. B. Speaker, first vice president; R. A. Harris, second vice president; F. E. Anderson, secretary; Homer Selch, treasurer; H. D. Lewis and H. G. Boyd, sergeants-at-arms; directors for one year, C. G. Fox, V. H. Hazelton, Don McCloskey, and F. E. Stewart; directors for two years, H. W. Meggs, W. E. Garber, Jr., B. J. Currie, and Max Goff.

VARY OVERHEAD METHOD —

(Continued from page 77)

this formula, 16 per cent would be added to the material cost, 72 per cent would be added to the direct labor cost, and the resultant figures would be added together. The final result would be the selling price. It would comply with the markup identification requirements of CPR 93 and would identify to the customer just what was the method of finding the selling price.

Divided Overhead

What is meant by divided overhead? The sheet metal business is really two or perhaps three separate businesses, each with a separate and distinct overhead.

In most of the other specialized construction trades, the contractor buys the components and fabricates them into the job on the site; that is, he manufactures nothing but buys everything as completed or shelf items. With the plumber, it is pipe, fittings and accessories; with the electrician, it is pipe, fittings, fixtures, equipment, etc.

This is not true of the average sheet metal or heating contractor. It probably is true to a large extent with the contractor doing only the installation of rain carrying equipment, but not with the general sheet metal or heating contractor.

This contractor, in the main, manufactures or fabricates practically all of his own sheet metal work. He does this in his own shop which requires certain equipment and is definitely a manufacturing process and no part of the construction industry as such.

A manufacturing overhead is far different from a construction overhead. What the sheet metal contractor does is to take an average overhead percentage covering his whole operation, which, as pointed out in the bracket overhead discussion, can be considerably out of line with reality.

Determining Selling Price for Shop Work

Contractors should consider the manufacture of their sheet metal requirements one complete manufacturing operation, and compile a selling price on the goods produced in the shop just as if that were the end of their operation and they were going to sell all of their manufactured products to others. They should operate upon the same basis that would be necessary if they were producing tailor made sheet metal items such as ducts, fittings and pipe for other sheet metal installation contractors, or to sell to a customer who was going to do his own installation work. The selling price so determined should be the base or cost price for the contracting end of their business.

This method of operation holds several distinct advantages. First, it makes it possible to find out whether the shop is making money or is just an expensive luxury. Second, it gives a better cost base for the contracting end of the business and also gives a comparison of the profit possibilities in each of these fields. Third, in such phases of sheet metal work where prefabricated materials are available, operating in this fashion should show the contractor whether he saves or loses by operating his own shop.

Shop and field are two separate and distinctive types of business with entirely different methods of determining costs. It behooves the contractor who really wants to operate upon as sound a basis as possible, to look carefully into this question of shop costs.

This involves machine hour rates, storage, production and administrative overheads and other items which will not be gone into at this time.

It is certain that one day, more sheet metal shops will be run on a far more efficient and factual basis than is the case at present.

Every cost and every earning must be properly recorded and properly allocated. If the contractor cannot tell from his accounts just what he is making or losing by operating a shop or whether or not he is making money on construction, he does not have a proper accounting system. He should be able to accurately tell the cost of each item manufactured in his shop and he should be able to closely foretell the cost of each item of operation in either the shop or field.

Advantages of the General Overhead Method

In the final analysis, overhead is the relation between the sum of all those costs of doing business which cannot be charged directly to jobs and the total sales during any given period. Using the overall relationship or general overhead as the basis for estimating job costs is good accounting, since this total relationship must be considered.

The general overhead method does not preclude the use of either rolling overhead or bracket overhead, for both of these methods consider overhead as a percentage of sales.

Where the labor and material are fairly equal in price or when the material cost is far above the cost of the labor, the overall method can be quite advantageous financially.

Through use of a simple table or a simple method, the application of overhead and profit too can be accomplished with a single multiplication with this general overhead method. This is done by finding the reciprocal represented by the combined labor and material percentage. For example, to secure a 10 per cent net profit when the overhead is 20 per cent, multiply the cost of labor and material for an estimated job by 1.43 and the result is the correct selling price.

Other Methods Beneficial

Rolling or progressive overhead is still the best method of finding the percentage of overhead for any method of application. Bracket or job overhead is also a great step forward. Of what use is it to do a great volume of business, only to be forced by the inexorable laws of mathematics to do a considerable amount of it at a loss?

The contractor who delves sufficiently into this idea and finds practical ways and means of exact determination of the overheads in the various brackets of his business, will outdistance competition. Many contractors now do this to a certain extent with excellent results, and more should sell business on the basis of the actual job overhead — not an overall or general overhead.

Special Value of Overhead on Labor

Overhead on labor seems to be the method most used in large manufacturing establishments, and has much to recommend it. There is very little factual information available in the sheet metal industry upon which to base conclusions in this matter, though a survey made several years ago by the Sheet Metal Contractors National Association disclosed that overhead as a percentage of direct labor runs from 44.345 to 162.5 per cent.

If this report was factual in regard to the percentage spread among the different shops, then this method has little value for comparison purposes. If, on the other hand, there is great similarity between the overheads thus calculated in shops doing the same type and size of work, it could have great comparative value. That is something which will not be found until a considerable number of contractors are willing to give out sufficient factual information to some central individual or agency so that a real study can be made. It would be invaluable to the industry.

By applying overhead exclusively on labor, a contractor bidding a job has no financial concern as to whether he or the owner or his general contractor supplies the material. He has his overhead and profit figured in either way. If it is a job where a considerable portion of the old material from another job is to be used, there is still no financial concern.

Also, this procedure is in line with the practices of most of the medium and large manufacturing concerns. They understand this way of doing business and can come to an agreement either on time and material or lump sum jobs or any other means of compensation more easily and with less friction than in the overall application method or any modification of it.

Since it involves so little markup on the material and equipment, the method appeals to large businesses which can buy everything required, perhaps even at a lower price than contractors can. Consequently, they don't feel they are being over-charged.

Another advantage has been described by a large sheet metal contractor in the Midwest. He says, "Suppose we bid a large roof drainage job. First the material is to be galvanized of the proper gauge. Then it is decided to change to copper and finally to stainless steel. If we applied a general or overall overhead, there would be a great difference in the three prices that would be way out of line with reality. The labor on the three types of jobs would not be too far apart but there would be a vast difference in the material prices. When we apply overhead upon direct job labor and then add the material with only a small markup, we are making our fair profit and not over-charging the customer."

This concludes the discussion on overhead. The final article of this series will be concerned with the effect of turnover on profits, the handling of surplus funds and the building of an estate.

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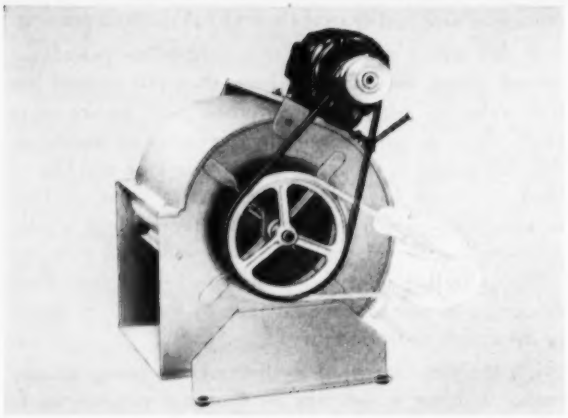
FOR TOP-QUALITY AIR CONDITIONING BLOWERS



SERIES "X" BLOWER ASSEMBLIES

... used as standard equipment by the leading furnace manufacturers. For all hi-boy, low-boy, counterflow and horizontal furnaces of 40,000 to 200,000 BTU rating. Available in four standard discharge styles: Bottom horizontal, top horizontal, bottom vertical, top vertical. Duo-multiblade wheel, statically and dynamically balanced ... one-piece bridge motor mount ... self-aligning bearings ... four-point bearing suspension ... heavy-gauge cold-rolled steel scroll.

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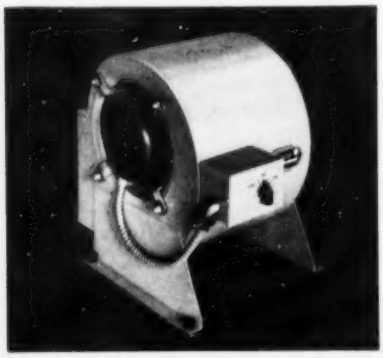
... for converting coal, oil or gas gravity furnaces to forced air. Available in five sizes for furnaces ranging from 80,000 to 225,000 BTU rating. Air handling capacities from 1,200 to 3,200 CFM at 3/8" static pressure. Quiet running, economical to operate, easy to install. Easy access to filters and blower assembly through removable rear panel of smoothly styled cabinet. Motor has overload protection and resilient mounting.



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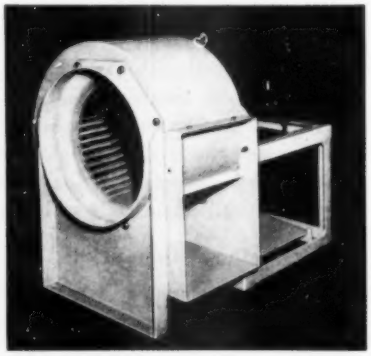
... ideal for hi-boy, low-boy, counterflow and suspended furnaces. Can be designed into furnace in any operating position desired. GE motor functions efficiently at any angle — shaft down, up, horizontal or in any intermediate position. Lubrication sealed in for life. Five speeds available at a flick of a switch. 65,000 BTU capacity, compact size, 10½"x 15½"x 14¼". Balanced delivery ... quiet operation ... completely assembled, ready to mount in furnace.



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***10 furnaces in 1**

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type of burner

1.	GAS	6.	
2.	PRESSURE OIL	7.	
3.	VAPORIZING OIL	8.	
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"Customer's Choice", not **"Dealer's Choice"**, is the game to play in today's market. Your customers get a complete selection—over 100 units—with the Weir-Meyer line! Two new Winter Air Conditioners, the B-11 and the B-13, round out the Weir-Meyer group of Hi-Boys. Their versatility—both are really *10 furnaces in 1**—makes them real sellers... and a sure bet to ease your inventory problem. Fit into less space than an easy chair—yet pack an incredible heating capacity (For gas: 105,000-160,000 Btu/hr input) (For oil: 120,000-168,000 Btu/hr @ bonnet). The secret is the exclusive D-shaped Thermatic Radiator, a "heat-trap" design *without* condensation pockets. Other famous Weir-Meyer features: All-steel, one-piece heating element — absolutely prevents fume leakage. Large filters. Over-size, rubber-mounted blower. SEND COUPON BELOW FOR FULL INFORMATION.

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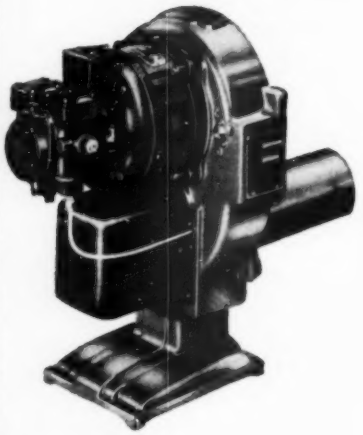

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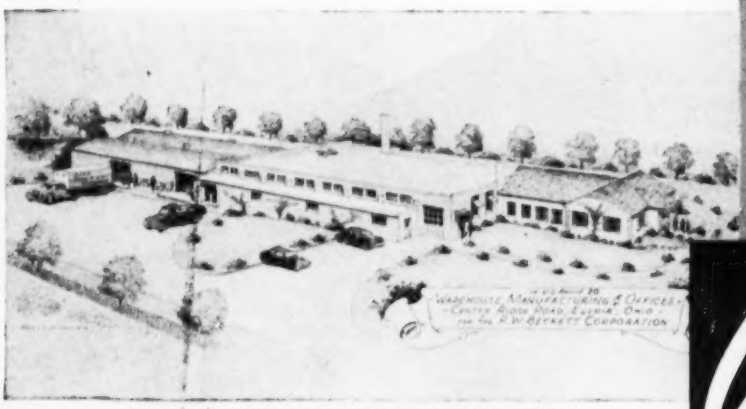
The Beckett Commodore has no equal for quiet operation and smooth running — in the tightest furnaces — for Unit Applications — or for Conversion Installations.

★ **CUSHIONED POWER UNIT** . . . Motor, fuel unit and fan are suspended thru live rubber Cushion Mounts — there is no metallic connection to the Burner Housing.

★ **REDUCED DIMENSIONS** . . . The projection of the burner from the furnace has been reduced 3 inches — without sacrifice of capacity.

★ **SERVICE STILL EASIER** . . . Now, even the motor brush is eliminated. The Beckett Commodore is the easiest of all burners to adjust — the easiest to service.

★ **A NEW ADJUSTABLE BASE** . . . For added eye appeal and to simplify installations a new adjustable pedestal is provided.



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Quality, Adaptability, and Ease of Adjustment Assure *Peak Performance* from the First Installation

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By using a parallel instead of a series heater, the DETROIT system gives you one heater for *all* jobs. There is *no choosing* from a large assortment of heaters—*no adjusting* of variable resistors. No other thermostat will work properly unless the correct heater selection or adjustment is made, but the DETROIT Thermostat eliminates all this guesswork because it's *always* just right for the job.

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HEATING WHOLESALERS —

(Continued from page 90)

portance; they are engineering, service, and sales," Mr. Denges said.

"Engineering of combination cooling and heating systems presents a new challenge to our industry, but I feel we are in a better position to cope with this problem as a result of our recent experiences with the development of automatic forced air heating equipment. Manufacturers must continue to conduct training courses.

"I suggest to you as wholesalers that you have at least one man in your organization fully qualified to handle all phases of cooling, and he in turn should then train other members of your company as well as your dealer outlets.

"From my company's own experience, we know that good equipment has been replaced where only minor adjustments would have corrected the difficulty and thus overcome inconvenience to which the customer was subjected.

"Last, but certainly not least, is a good sound sales program. Sales tools such as literature, manuals, and advertising mats are available, and wholesalers can urge that they be properly used by dealers."

How Summer Cooling Affects Building

J. F. Knoff, Airtemp Div., Chrysler Corp., confirmed all of the data previously presented and added that summer cooling was bringing about many changes in the building of new homes. He pointed out that with complete air conditioning available, the builder can eliminate many of the expensive types of casement windows and locate the building in any position on the plot that makes for better use of room location.

Residential air conditioning is going to be "big" because people have learned to enjoy their comfort at work, at the theater, in the department store, and when they travel, and they are not going to be satisfied until they have air conditioning in their homes too, Mr. Knoff said. He warned that, "Good service is the joint responsibility of the manufacturer, wholesaler, and dealer. All should work toward a common purpose to assure the customer a good installation and satisfaction. This can only be done if the customer is made aware of the operating costs as well as the initial installation expense. This operating cost explanation will help to reduce complaints when the customer knows that expense must be considered to obtain comfort, that a poor, undersized system is worse than no conditioning system at all."

Mr. Knoff pointed out that the owners of the 5,000,000 new homes built since the end of World War II are now in a financial position to consider adding cooling to their warm air heating systems because most of the expenses of outfitting a new home have been paid for and the home owner can turn his attention to better living with more comfort, and at the same time make his home worth more by bringing it in line with the modern market. These 5,000,000 homes are the best prospects for the modernization market, he said.

Offers Merchandising Program

Other subjects on the agenda were merchandising in 1953 and material handling. R. C. Overmyer, Stewart-Warner Corp., outlined a four point program to aid the wholesaler in his merchandising program.

1. Set yourself up.
   a. Survey your program.
   b. Improve your displays and their location.
   c. Figure your contacts with your dealer outlets.
   d. Train your personael in the products being handled and make them more sales conscious.
2. Organize your dealers.
   a. Furnish a stock plan to them.
   b. Teach the use of selling tools furnished by you.
   c. Emphasize how to close with a prospect.
3. Conduct dealer schools.
   a. Teach product knowledge.
   b. Merchandising techniques — (call on all persons in your locality who can contribute their ability in this respect).
   c. Teach use of trade magazines and how they can be effectively used to broaden the scope of applications.
4. Step out and show them.
   a. Offer to call on customers and illustrate how to develop a prospect.
   b. Offer the technical assistance of your cooling engineer.
   c. Turn over prospect leads for follow up.

Advises on Material Handling

O. T. Henkle, Jr., The Mercury Mfg. Co., used a motion picture to illustrate the best way to handle packaged equipment and to select mechanical handling equipment. He advised that there are many experts who could be called in to help lay out a good material handling plan, but the wholesaler must remember that each warehouse is an individual problem and no one has all of the answers. The experts can only offer suggestions to correct unsatisfactory situations, but the actual working out of the solution will be up to the individual.

He suggested that each wholesaler work out his own material handling technique and select mechanical equipment to meet his own requirements. "In general", he said, "there are two types of lift trucks, the electrically operated and the gasoline driven. Both perform excellently when properly used. The gasoline truck is most economical when used for spasmodic operations and where ramps are frequently used to reach different floor levels, whereas the electrical truck has proven more satisfactory where the work requirements are for steady operation eight hours a day and five days every week. He cautioned about the selection of equipment. "A fork truck", he said, "should be used for stacking jobs, never as a carrying vehicle. If material must be carried for long distances, a platform truck will soon prove its effectiveness over the fork truck due to its speed and lightness of weight."

New officers elected for 1953 are: G. F. Wheelock, president; W. H. Bowe, Jr., first vice president; G. A. Ashburn, second vice president; W. L. Dulle, treasurer. The 1953 Spring Meeting will be held at the Grove Park Inn, Asheville, N.C., June 22 to 24.

LESS POTENTIAL TROUBLE WITH SERVEL

All-Year AIR CONDITIONING

● Dealers who sell Servel *All-Year* Air Conditioning have a minimum of service worries.

Most air conditioning service calls are for work on pressure leaks, motors, compressors and pressure-reducing valves in the cooling system—troubles that are impossible with Servel because Servel's unique "no moving parts" design eliminates these potential trouble-makers.

A recent analysis of 1117 service calls on refrigeration equipment of various makes* showed that in 852 cases (76.3%), the trouble could *not* have occurred with the Servel absorption refrigeration unit, because the Servel cooling system is not pressure operated. The unit is factory-sealed, has no compressor—has *no moving parts.*

No wonder Servel has such a powerful sales appeal! No wonder dealers and customers alike choose Servel for long-life lasting satisfaction!

Right now is the time for you to look into the big profit possibilities that Servel *All-Year* Air Conditioning holds for *you.* Remember, year-'round air conditioning is the fastest growing new development in the entire home-building field . . . and Servel is way ahead with more installations than any other make.

Write today for all the facts on your profit opportunities with Servel *All-Year* Air Conditioning. Address Servel, Inc., Dept. AA-3, Evansville 20, Indiana.

Servel

Heats and cools with gas or oil

*From a survey conducted among Refrigeration Service Engineers Society members and reprinted in *Air Conditioning and Refrigeration News.*

***The name to watch for great advances in* — AIR CONDITIONING ✓ REFRIGERATION**

LET *Peerless* PLAN A PROFITABLE

FAN and BLOWER SALES SET-UP

with YOU . . .

PHONE

WIRE

WRITE

Don't let the Middle-Size Job get away

There are three kinds of fan and blower jobs: big, middle-size and small. Of these, the "middle-size" jobs baffle wholesalers and dealers because they require more manpower, engineering data and quick information than is often available. Manufacturers throw in their resources on the big jobs, but they are so busy figuring the big ones that the "middle-size" jobs are neglected. *And,* that's where Peerless steps in!

Let us set up a fan and blower sales plan with you. Let's go after and get the "middle-size" industrial and commercial jobs. We have a complete line to sell and nation-wide experience since 1893. The Fan and Blower Division at Peerless is staffed by practical engineers who can give first-hand engineering data, pricing and delivery information to you without delay. All you need to do is wire or call (at our expense) and get the information you need for your jobs. If more time is needed or additional data is required, Peerless will call you back or have an engineer call on you personally. The Peerless plane is often used for this speedy engineering service. This is the way you and we can solve the "middle-size" job problem, and all you need to do to set this plan in action is to give us a call.

If you have a "middle-size" job now, give us a call today — don't let the job get away. You'll be surprised how we eliminate red tape delay.

Letters and wires also receive immediate attention. At all odds, let's plan to get more of the "middle-size" jobs with the Peerless sales plan.

Peerless Belt-drive Utility Blowers available in sizes to meet every air moving requirement. A complete ready-to-install package.

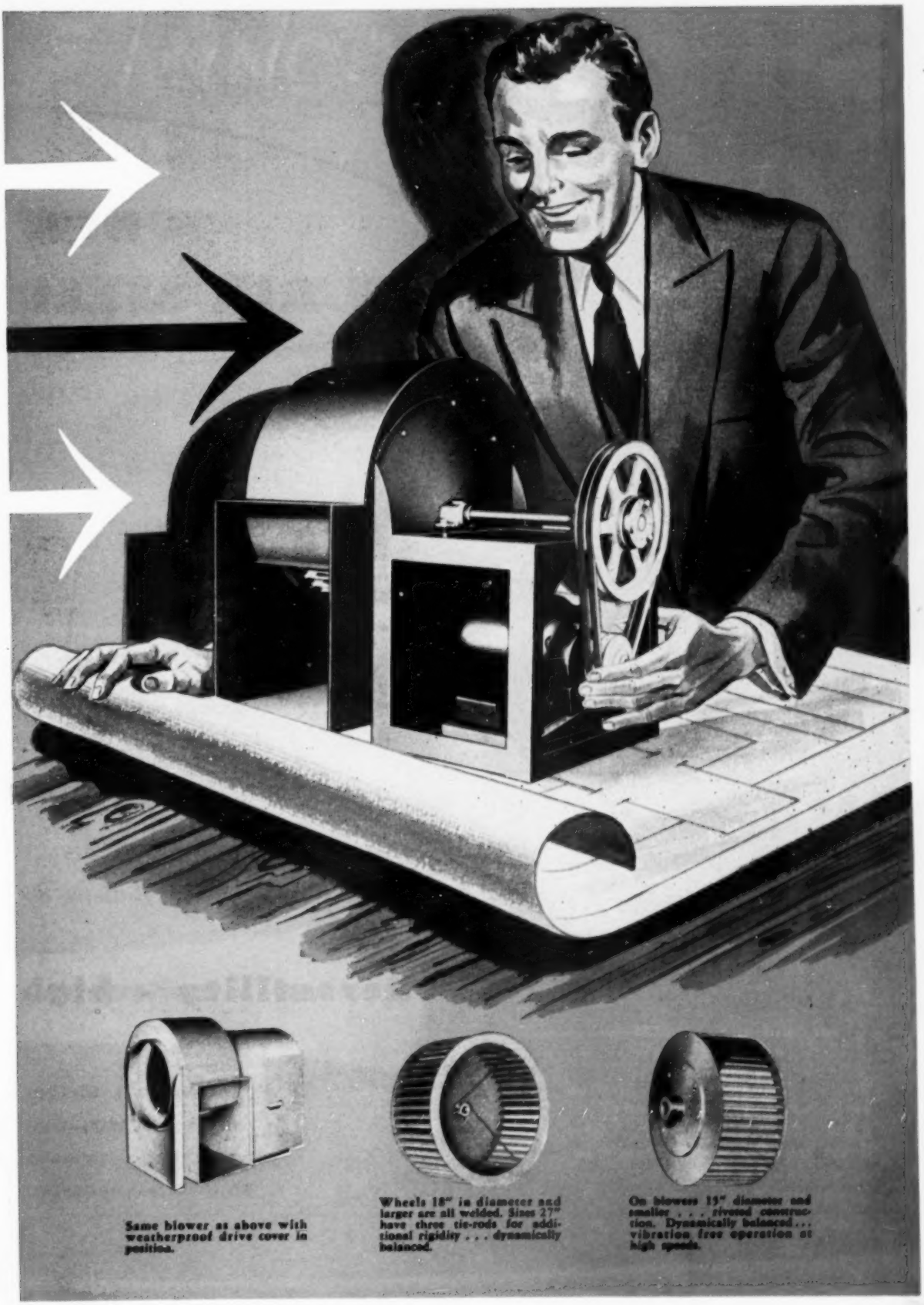
"SMOOTHEST PERFORMERS ON THE MARKET"

Peerless Electric

THE PEERLESS ELECTRIC COMPANY

FAN AND BLOWER DIVISION

1405 WEST MARKET STREET • WARREN, OHIO



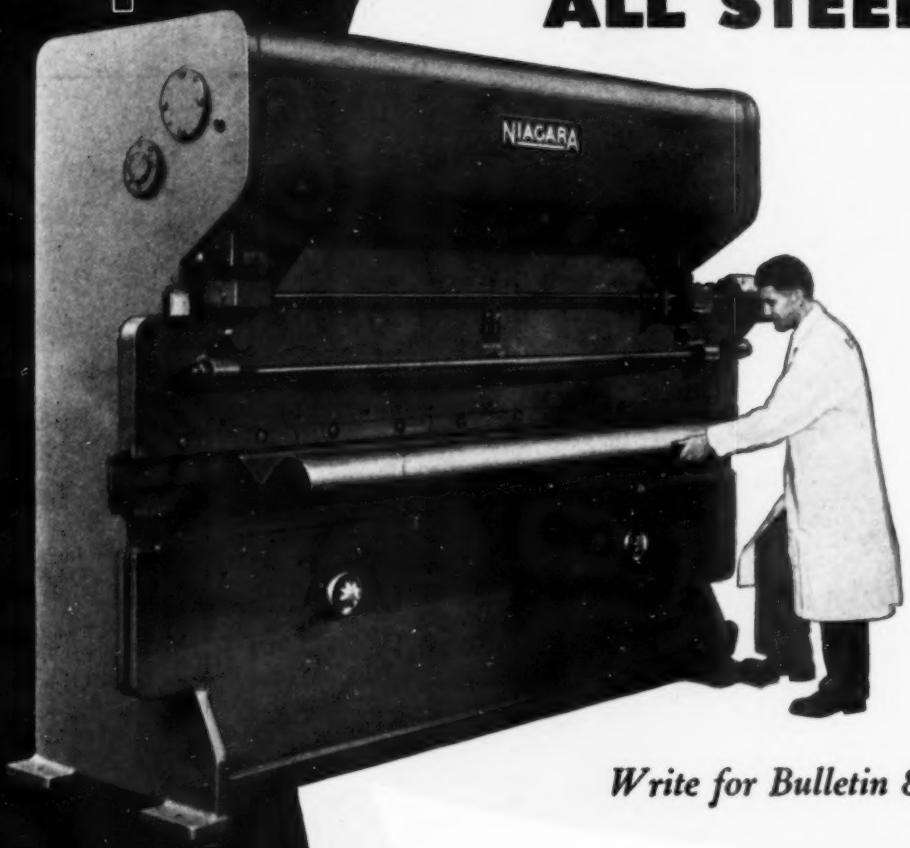
Same blower as above with weatherproof drive cover in position.

Wheels 18" in diameter and larger are all welded. Sizes 27" have three tie-rods for additional rigidity . . . dynamically balanced.

On blowers 15" diameter and smaller . . . riveted construction. Dynamically balanced . . . vibration free operation at high speeds.

NIAGARA

A NEW ALL STEEL



Write for Bulletin 89

versatility - high

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BEADING • EMBOSSING

50 TON SERIES

For Fabricating Sheet Metal and Light Plate

THESE HIGH SPEED PRESS BRAKES are perfectly suited for the smaller and lighter jobs that do not justify a large investment in equipment. They offer the advantages of big brake performance by incorporating features ordinarily found only in large expensive machines.

NIAGARA MACHINE & TOOL WORKS • BUFFALO 11, N. Y.

ANNOUNCES

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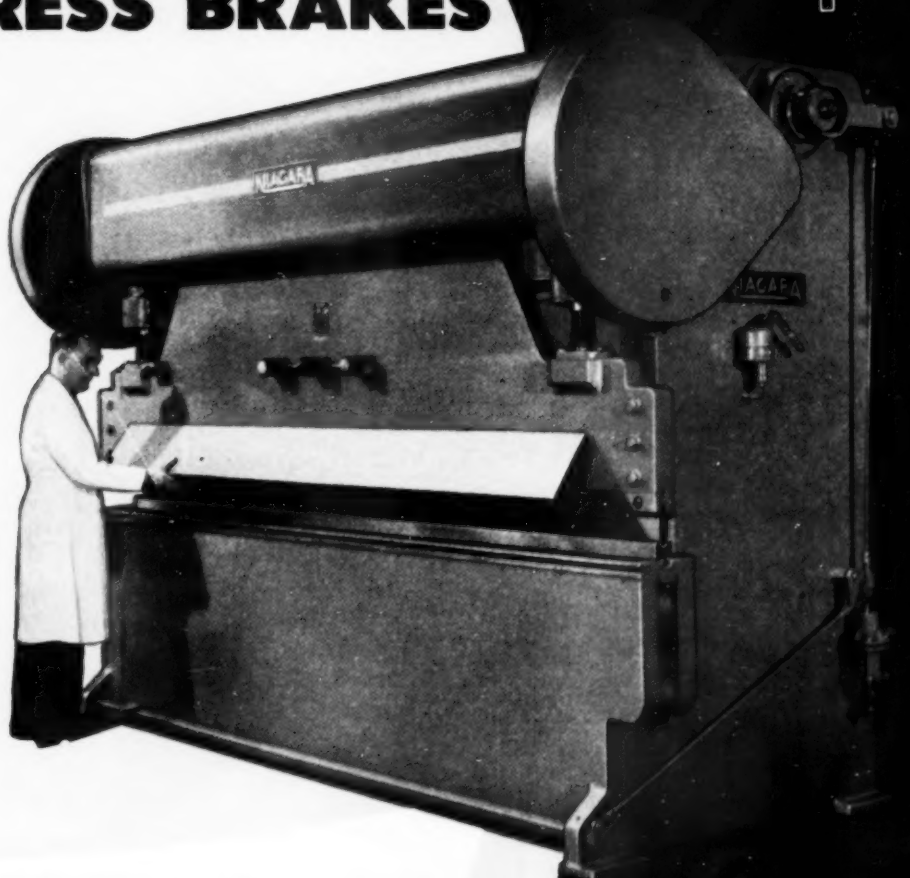

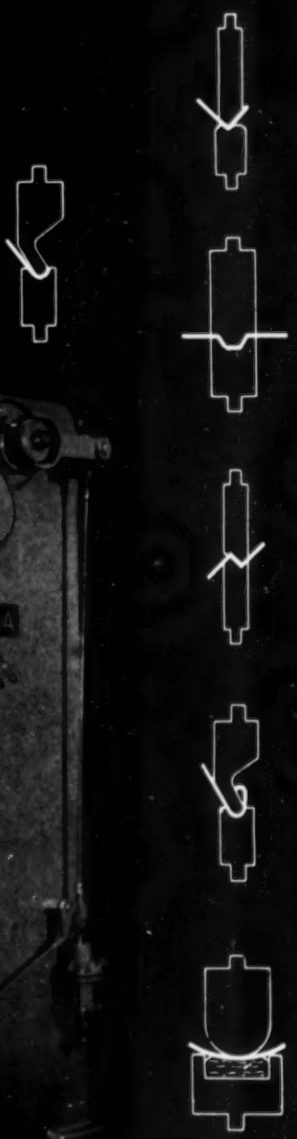

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For Fabricating Heavy Plate
(In addition to sheet metal)

THESE ULTRA MODERN, HEAVY DUTY PRESS BRAKES represent the ultimate in quality, stamina and performance. They are built to the highest standards of accuracy and workmanship for peak production under the most severe conditions.

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PACKAGED V-BELT FAN UNITS

BETTER FOR MANY AIR HANDLING APPLICATIONS

NEW! CLARAGE DEVELOPMENT

Clarage Ready Units are a notable advance in "packaged" fan units — highly efficient, compact, quiet in operation. And, like all other Clarage equipment, you can RELY on them for dependable, economical service.

MOTOR DRIVEN ASSEMBLIES—NO EXPENSIVE FOUNDATIONS REQUIRED

Clarage V-belt Ready Units come in 18 sizes — capacities to 12,000 c.f.m. . . . within their range, the ECONOMY ANSWER to almost any INDOOR or OUTDOOR air handling requirement.

Use Ready Units and save the expense of building separate motor foundations. Use Ready Units and eliminate alignment problems. Use Ready Units for installations in record time and at lowest cost consistent with quality fan equipment.

Ready Units with or without Outdoor Covers shipped immediately. Specially constructed units for handling corrosive gases, etc., take a little longer.

WRITE FOR READY UNIT CATALOG 515 giving details, capacities and dimensions on the most modern "packaged" fan units available today — address, CLARAGE FAN COMPANY, Kalamazoo, Michigan.

INDOOR JOBS

Standard Ready Units (except three largest sizes) afford protection to fan bearings, motor and drive as shown below.

OUTDOOR JOBS

Cut below shows Ready Unit equipped with (easily removable) Outdoor Covers shielding all working parts from rain and snow.

LARGER SIZES

Cut at left shows standard Ready Unit as built in three largest sizes. These larger units, too, can be equipped with Outdoor Covers.

68 PAGES OF VALUABLE INFORMATION

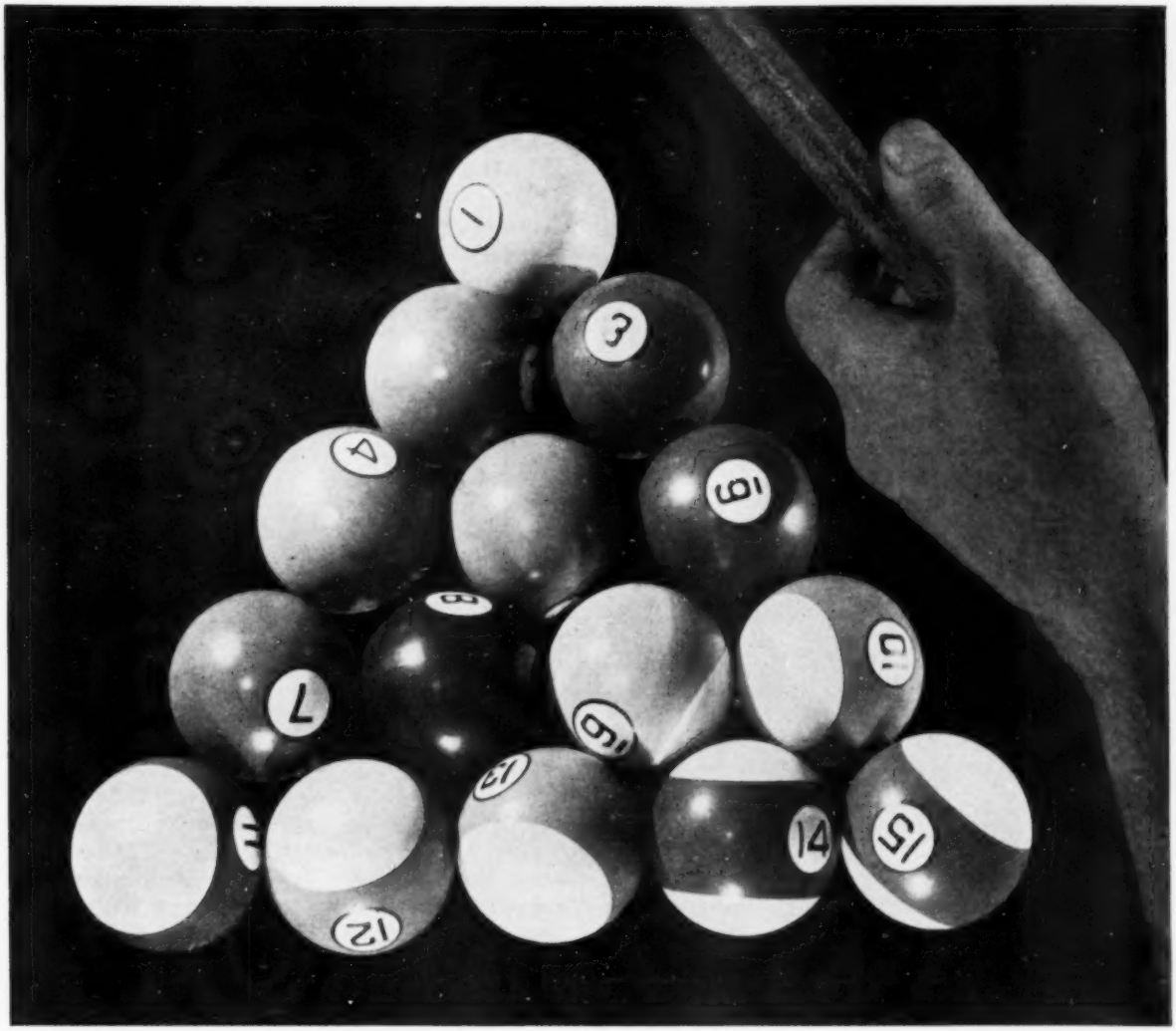
New Manual shows how to properly install and service Clarage fans, blowers and air conditioning units . . . valuable information adaptable to almost any type of fan job. Sent without charge to factory executives, engineers and maintenance officials.

You can Rely on...

CLARAGE

Headquarters for Air Handling and Conditioning Equipment

SALES ENGINEERING OFFICES IN ALL PRINCIPAL CITIES • IN CANADA: Canada Fans, Ltd., 4285 Richelieu St., Montreal



ALL RACKED UP FOR A PERFECT BREAK!

No need to be behind the eight ball because direct-factory or cut-rate competition is taking the play away from you in your own territory. Do business with Perfection . . . and *know* your territory and profits will be protected.

Perfection gives you a solid shot at your market because Perfection gas or oil-fired furnaces are all competitively priced and include the only *real exclusives* in the heating business. The amazing Regulaire* control and the fuel-saving 3-stage fire provide you with the clinchers that make selling a lot easier.

Then, Perfection backs you with the solid stability that comes from 65 years of doing business. If you're a jobber or dealer who is looking for a better break, write Perfection Stove Company, 7403-B Platt Avenue, Cleveland 4, Ohio.

Perfection's 3 point platform for dealers

Completely New!

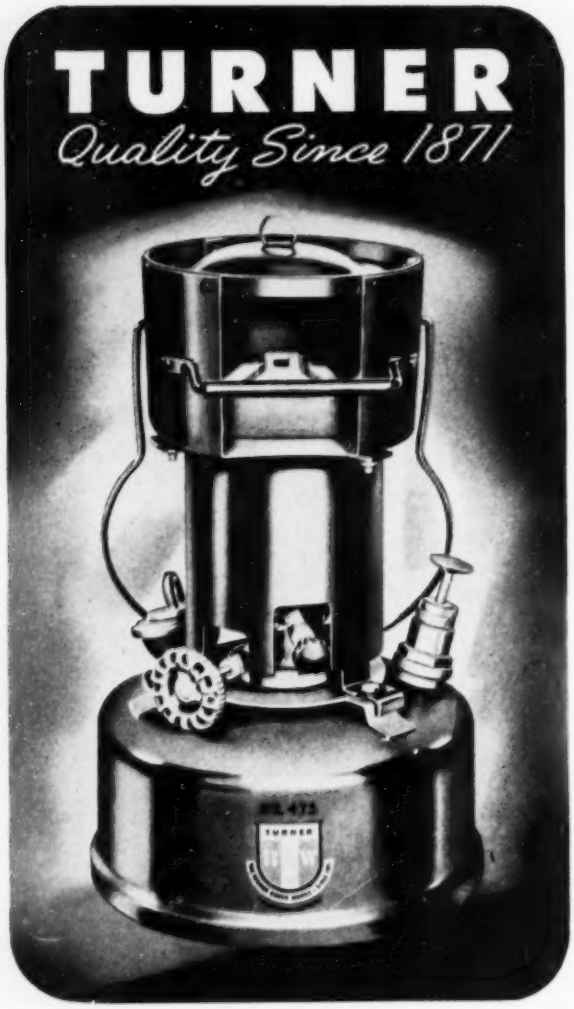
LO-HI-BOY Model G-805 *Gas-fired* furnace.

Less than 61 inches high. Truly quiet single-port burner. Easily changed to oil. Matching Summer Cooling Unit.

*Patents Pending

65 YEARS OF FINE PRODUCTS

Perfection



No. 475 Low Pressure
TINNER'S FIRE POT

● Smokeless . . . sparkless . . . sootless! Complete with Turner's exclusive "Carburetor Control" for more perfect combustion; also a flame control — for exact heat desired — which automatically cleans the orifice. Construction assembly permits quick, easy accessibility . . . windshield, top-plate, and bail handle are one unit, and can be lifted from tank by loosening one wing nut. Burner coil is made of extra-heavy seamless steel tubing, protected by sturdy outer jacket that maintains heat without overheating; can be generated and used in heavy wind. Fuel capacity — one gallon; burns for 9 hours on one filling. Get details, too, on Turner's popular Plumber's Fire Pot (No. 275); also Turner's complete line of Blow Torches.

See Your Jobber

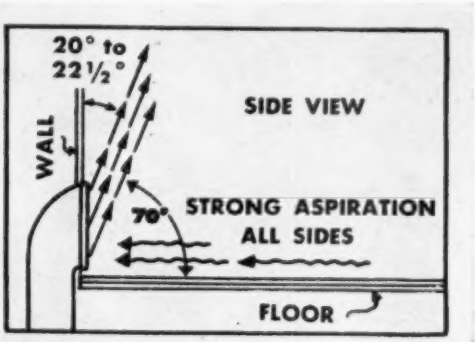
THE TURNER BRASS WORKS
SYCAMORE ILLINOIS
Since 1871

EQUIPMENT DEVELOPMENTS —

(*Continued from page* 115)

Wall Diffuser

SERIES 45 wall diffuser, for sidewall or baseboard outlets, which is designed to provide correct air distribution, spraying warm air upward and to all sides at a reasonably high velocity — Lima Register Co., Lima, Ohio. The diffusion pattern starts at 45 deg from the floor and extends over a 90 deg fan-shaped spread which blankets the cold outer wall or window area. A feature of the



new diffuser is the 22 to 22½ deg diffusion angle out from the wall, which is intended to assure the correct 70 deg upward deflection from the floor for maximum efficiency, and for avoiding air scrubbing or streaking of walls. Vertical diffusion blades, ¼ in. horizontal louvers, and special end deflectors are factory-set for balanced velocities, the manufacturer states. The diffuser can also be installed in the ceiling, and is available in two sizes: 10 x 6 in., and 12 x 6 in. AA 10

Counterflow Winter Conditioner

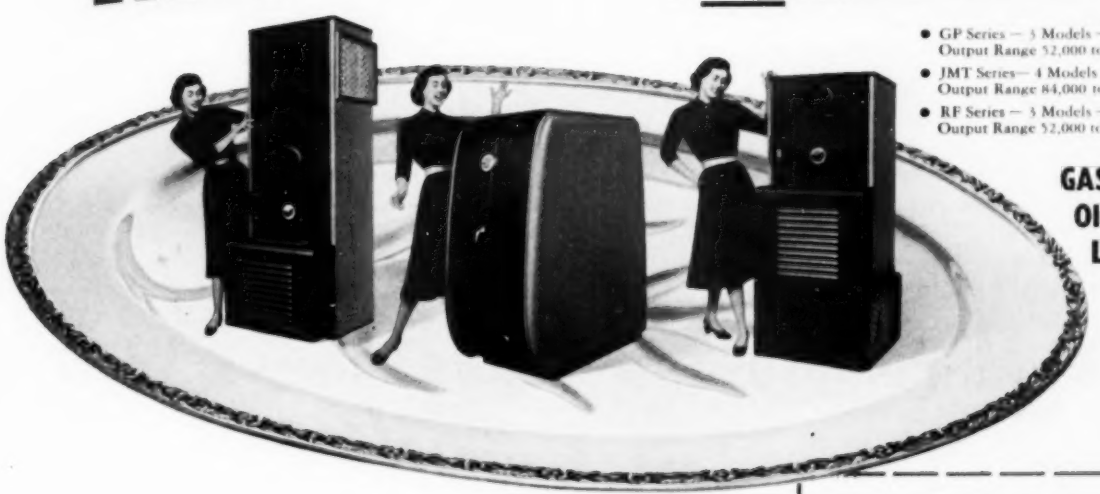
GAS-FIRED counterflow winter air conditioner, Model G7-65, rated at 65,000 Btu — Armstrong Furnace Co., Columbus, Ohio. It is designed especially for the small, basementless, one-floor home using perimeter heating. Return air is brought in from the top and warm air is discharged through the bottom into an under-the-floor heat distribution system. Size is 17 x 26 x 62½ in. Featured are a built-in filter rack, automatic humidification, extra safety control, and built-in diverter. A factory installed wiring harness connects all electrical parts with the junction box, and removal of a front panel exposes the controls, blower and motor for servicing. The double-width blower has a delivery range of 550 to 700 cfm. AA 11

Time Switch for Air Conditioners

No 919 PORTABLE plug-in time switch which will control air conditioning units and other electrical devices, turning them on and off at the times designated — Fork Clock Co., Inc., Mt. Vernon, New York. The time switch

MOR-SUN OFFERS MORE!

+ MORE QUALITY
+ MORE PRODUCT IMPROVEMENTS
+ MORE INVENTORY CONTROL
+ MORE CAPACITIES
+ MORE MERCHANDISING
+ MORE ADVERTISING
+ MORE PROFIT OPPORTUNITY



- GP Series — 5 Models — BTU Output Range 52,000 to 95,200
- JMT Series — 4 Models — BTU Output Range 84,000 to 152,000
- RF Series — 5 Models — BTU Output Range 52,000 to 95,200

GAS
OIL
LPG

There are a lot of Plus Signs for Distributors, Dealers and Installers in the new MOR-SUN Furnace Line. Constant improvement in our products through better design and advanced engineering combined with precision mass production methods have resulted in MOR-SUN Furnaces delivering TOP DOLLAR VALUE.

The new, more efficient Heat Exchangers — *now guaranteed for 10 years* — used in all MOR-SUN models are outstanding examples of design and engineering improvements. Our manufacturing facilities have been expanded to enable us to deliver greater production by precision manufacturing methods. Add to this quality of product a forceful advertising and merchandising program and you have the principal reasons why so many alert furnace men are turning to MOR-SUN for more profit opportunity. If you are interested in quality merchandise to fit today's marketing conditions, *look to Morrison.*

For MORE PROFITS with MOR-SUN... Mail this Coupon

MORRISON STEEL PRODUCTS, INC.
609 Amherst Street
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Gentlemen:

Please send me complete information on Mor-Sun Furnaces and the Mor-Sun Plan for Profit.

Firm Name _____

Address _____

City _____ Zone _____ State _____

☐ Distributor ☐ Dealer ☐ Installer
(please check)

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MORRISON
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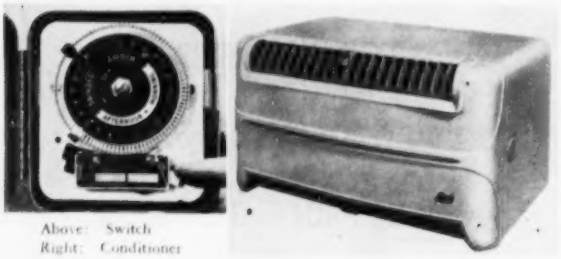
609 AMHERST STREET • BUFFALO 7, N. Y.

ALSO MANUFACTURERS OF ROLY-DOOR STEEL SECTIONAL GARAGE DOORS AND CARRY-ALL TRUCK BODIES

is plugged into the wall outlet, and the air conditioner is plugged into an outlet on the time switch. The circuit trippers are set for "on" and "off" at the times desired, and operation is then automatic. There are manual levers so that the conditioner can be turned on or off at different hours without altering the master cycle. For changing the cycle, the trippers are re-set. The switch measures 5 x 5 x 3½ in., operates on a-c current only, and has a capacity of 1650 watts. AA 12



Above: Switch
Right: Conditioner

Heat Pump Room Air Conditioners

REVERSE CYCLE room air conditioners which heat and cool by utilizing the heat pump principle — York Corp., York, Pa. Units are available in both window and console types, and in ¾ and 1 hp sizes. Modulation control, designed to prevent the unit from over-cooling, is also featured. The company's new 1953 line comprises 13 models in sizes ranging from 1/3 to 2 hp. Included is a new-style console type conditioner which permits installation in any type window which opens. This conditioner is portable, and has an air intake which does not protrude beyond the window sill. The 1/3 hp unit has four-way adjustable air distribution grilles and disposable type filters. AA 13

Warm Air Furnaces with Water Heater

METROPAC JUNIOR air conditioner, with 75,000 Btu rating, designed to provide year 'round domestic hot water, automatic warm air heating, recirculation of air in summer, humidity control and air filtering — Metromatic Mfg. Co., Everett, Mass. The unit features a 30 gal heavy galvanized water tank, a gun type oil burner, a heavily insulated jacket, four controls, a 2 in. thick combustion chamber, and air filters. It requires 6½ ft of floor space and is 69 in. high, including the built-in plenum. Other units are available in 120,000 and 180,000 Btu at the register, with up to 50 gal of hot water storage year 'round. By utilizing a special bypass damper control, the furnaces can circulate cooling air while heating water. AA 11

Slinger Ring for Fan Blades

WELDED ALUMINUM slinger rings designed to adapt all popular sizes of assembled Airistocrat fan blades to use as condenser fans for room air conditioners — Torrington Mfg. Co., Torrington, Conn. According to the company, this method of rolling a ring from aluminum strip permits a wide variety of welded ring diameters

The All-Purpose Saw You've Always Wanted

Milwaukee SAWZALL

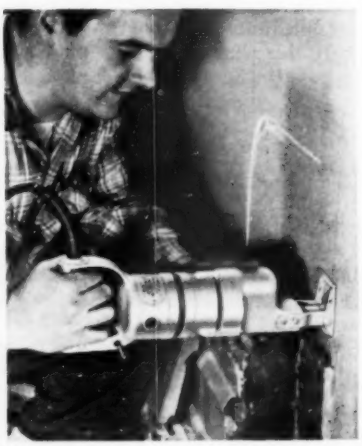
Not an attachment... but the NEW single unit, heavy-duty
PORTABLE ELECTRIC HACKSAW

Saws ANY material with amazing new speed, accuracy and efficiency . . . hundreds of labor-saving, time-saving uses on the job, in the shop, wherever 110 Volts are available . . . pays for itself quickly.

Super-powered with the famous *Milwaukee-Built* Motor . . . 2250 strokes per minute (¾" stroke) . . . lifetime-lubricated ball and roller bearings . . . weighs only 6¾ lbs. . . . fully guaranteed.

$78.50

Complete with Steel Carrying Case and Blades for cutting ALL materials.



On this remodeling job, the SAWZALL greatly cut the cost of installing a complete new, warm-air system. Breezes through plaster, wood, nails.

Call your Distributor or write us today for Folder SW-5.

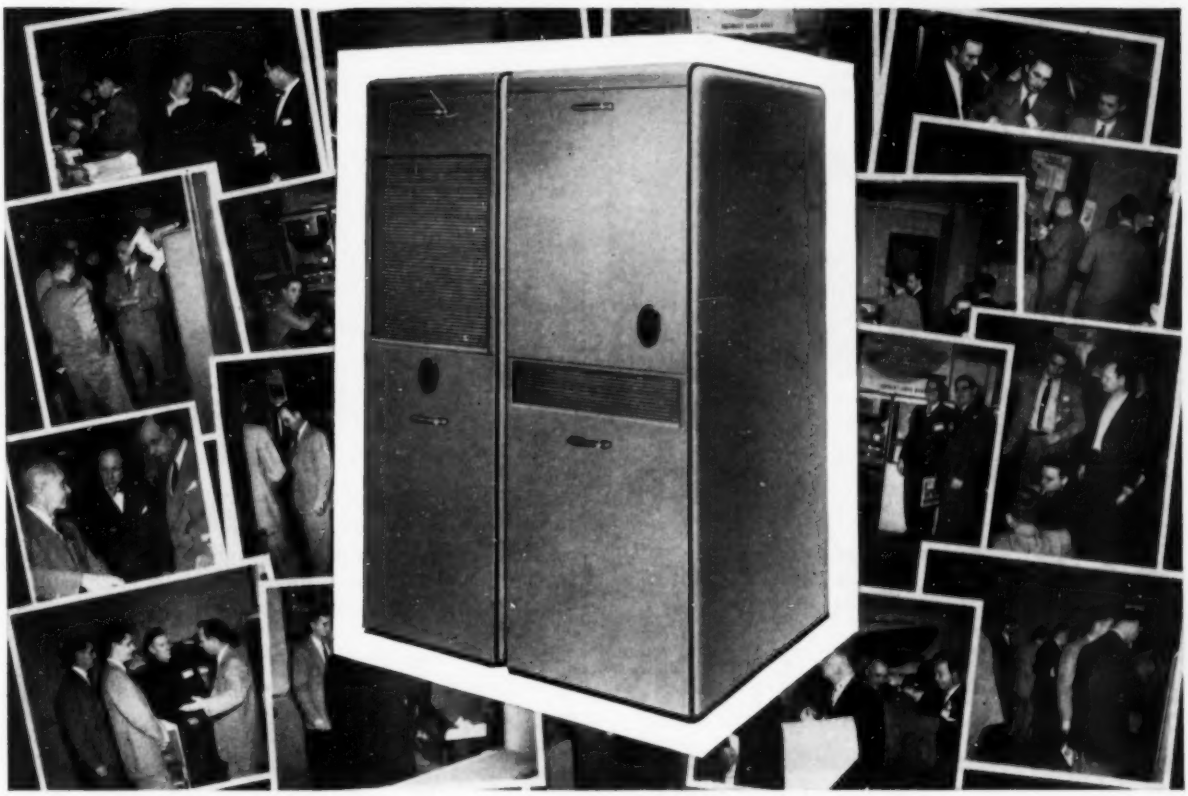
MILWAUKEE ELECTRIC TOOL CORP.

Portable Electric Drills, Saws, Screwdrivers, Hammers, Aerial and Bench Grinders, Sanders and Polishers.

5362 WEST STATE STREET • MILWAUKEE 8, WISCONSIN

Canadian Distributor: MATTHEW MOODY & SONS CO., Montreal

"COMMAND-AIRE" TWINS GET BIG RECEPTION AT NAHB SHOW!



Builder enthusiasm over truly Low-Cost year 'round conditioning promises an active market for you!

Builders enthused — as you will — over these unique features of Bryant's new "Command-Aire" Twins. For example, imagine *your* profit potential in year 'round home conditioning equipment that's . . .

20 to 35% lower in cost! Mass production techniques enable us to offer the "Twins" at a price millions of average income families can afford . . . families who will buy new homes (or convert old heating systems) in your area this year. Moreover, they will have the convenient option of buying . . .

Cooling initially — or later! Because the "Twins" are independent heating and cooling units, you can install the furnace first and add air conditioning immediately or later, according to the convenience of the buyer. And you can be sure about demand because the "Twins" are being . . .

Extensively advertised — on national and local levels — even right on the home site — to presell thousands who will buy new homes this year.

Available in many combinations! Gas or oil furnaces ranging from 50,000 to 175,000 Btu/hr and cooling units in 2, 3 and 5-ton capacities permit you to meet the conditioning needs of any sized house.

Get complete information on this unusual profit opportunity today! Contact your Bryant Distributor, or write: Bryant Heater Division, 17825 St. Clair Avenue, Cleveland, Ohio.

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HEATING • AIR CONDITIONING
WATER HEATING

THE WAY TO BETTER INSTALLATIONS

All Ohio Valley Furnace Fittings are made from prime-quality, full-gauge, galvanized steel—especially selected from the best mill production for quality furnace fittings. They're easy to install, fit well quickly, and enable you to make a better installation in less time. Handy cartons, clearly marked as to quantity, size, and type of fittings inside, make Ohio Valley Furnace Fittings even more convenient. For the best value on your next job—make sure you use Ohio Valley.

DO IT BETTER FASTER — WITH OHIO VALLEY

Carried in Stock by Leading Wholesalers

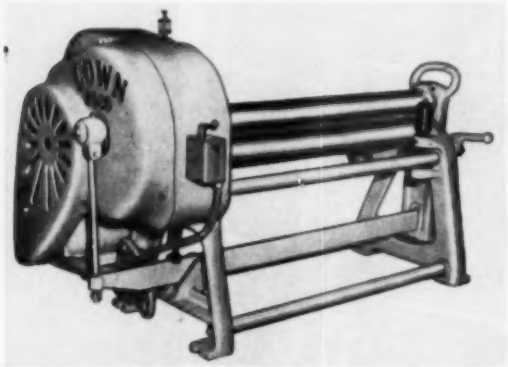
Ohio Valley Hardware & Roofing Company

METAL MANUFACTURING DIVISION, EVANSVILLE, IND.

and eliminates tooling for various sizes. The rings usually are used with the 10, 11 and 12 in. fans, though they can be made for any diameter above 10 in. AA 15

Slip Roll Forming Machines

SERIES G-500 Lown slip roll forming machines, built in two sizes, with 5 or 5¼ in. diameter rolls — San Angelo Foundry & Machine Co., San Angelo, Texas. The 5 in. machines are available in 3, 3½, 4, 5, 6, and 8 ft lengths;



the 5¼ in. machines, in 4, 5, 6, and 8 ft lengths. According to the manufacturer, gears are in constant mesh regardless of the position of the rolls because three-roll drive is used. Other features are rigid cast frames, alemite lubrication, and roll position indicators. AA 16

Winter Air Conditioning Units

1953 LINE of Arrow gas-fired winter air conditioners, in six sizes — Dowagiac Steel Furnace Co., Dowagiac, Mich. They are AGA approved for natural, manufactured, mixed and LP gas. AA 17

Automatic Gas Incinerator

AUTOMATIC GAS incinerator for residential or commercial use — Duo-Therm Div., Motor Wheel Corp., Lansing, Mich. It is available in five models, and in two or four bushel capacities, and may be operated automatically or manually. Suitable for either basement or utility room installation, it disposes of all garbage and consumes all burnable trash. Wet or dry garbage is inserted through a top-opening door. An automatic clock-timer is dialed to the minutes of fire desired (manual control optional), and the incinerator begins operating. AA 18

Fuel Tank Gage

MODEL 3175 FUEL oil tank gage with new type of weatherproof head — Rochester Mfg. Co., Rochester, N.Y. The head was designed to meet the needs of cellarless type residences which require that fuel oil tanks be placed outside the building. The head is molded in one piece, of Tenite, and is hermetically sealed to the flange. The interior of the head is sprayed with lacquer, except for two windows. The dial has a dual scale in large figures which can be read from either side. Gage action is magnetic. The new gage is corrosion and shock-resistant, and meets the standard submersion tests of the U.S. Army and Navy, the manufacturer states. AA 19

it pays to sell the Profit Line!

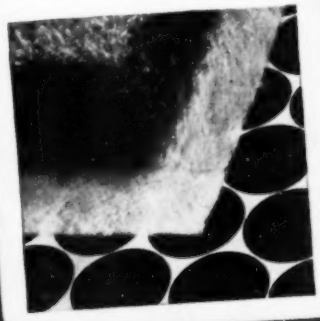
Glasfloss AIR FILTERS

3 PRODUCTS—30-50% MORE PROFIT

Glasfloss is a *complete line* of glass fibre disposable Air Filters—not a *single* type. With the Glasfloss Line, you sell the right filter for every clean air filtering problem, and make 30% to 50% more profit. There are 3 products—3 profits—all backed by a promotional campaign that hits hard to help you sell.

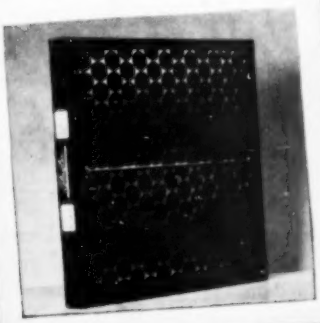
1 *Glasfloss*
I-S TYPE

For peak air filtering efficiency, the GLASFLOSS I-S Air Filter Unit is the answer. Here a strainer mat has been added to the famous long, glass fibres that make up the standard GLASFLOSS Air Filter pad. The combination brings air filtering efficiency to as high as 95%. No other air filter on the market can compare. Figured on Peak Efficiency you win with Glasfloss.



2 *Glasfloss*
STANDARD TYPE

This is the conventional type—the filter most in demand. The long, fine glass fibres provide a greater surface area to catch and hold more dust with less air resistance. The Glasfloss STANDARD Filter is primarily intended for home heating equipment and normal industrial installations. Available in all standard sizes. Competitively priced to beat the field.



3 *Glasfloss*
ROLL-PAK TYPE

Here is a product carefully planned for bulk users. Cut your own filter pads—fit them into your own frames and save, with every change, as much as 30% of your normal air filter costs. Available in rolls, 40" wide and 10' long and 1" and 2" thickness. Application is easy. Just roll it out, cut to size and put into position. The fluffy, fine fibres are easy on the hands. For Economy in bulk usage it's Glasfloss all the way.

Glasfloss 155 EAST 44TH STREET, NEW YORK 17, N. Y.

New!

Beautiful!

Mueller Climatrol

Types 116-216 Winter Air Conditioners

Pre-Wired

Pre-Assembled

Gas or Oil Convertible

Low-Cost Installation

Attractive — enclosed burners and controls, handsome styling, green crinkle finish. Compact—only 45" high, 24½" wide, 61½" long. Shipped assembled in two sections, makes installation easy — pre-wiring saves you time.

Cabinets are insulated with corrugated asbestos backed with aluminum foil for greater efficiency. Heat exchanger of heavy gauge, welded steel. Free-floating radiator is connected to drum at back only, for quiet operation. Continuous up-draft flue travel, with flue outlets on either side of cabinet simplifies installation. Large size, centrifugal type blower gives better air delivery.

Designed and approved for oil or gas convertibility — install for oil now — change to gas later at low cost. The new Mueller Climatrol Types 116-216 are the latest word in automatic home-heating equipment from the Big Name in Heating — Mueller Climatrol!

This is only *one* of the many new items in the 1953 Mueller Line. Write for descriptive literature to the *L. J. Mueller Furnace Co., 2030C, W. Oklahoma Ave., Milwaukee 15, Wisconsin.*

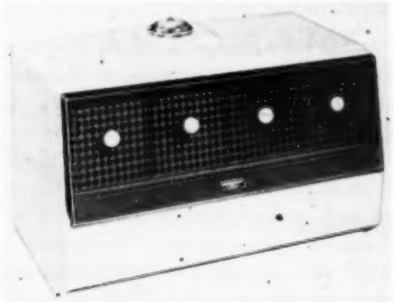
96th Anniversary

Mueller Climatrol

D-1388

Window Type Room Air Conditioner

WONDERAIR window type room air conditioner, featuring single knob operation and offered in ¾ and 1 ton sizes — Servel, Inc., Evansville, Ind. The one-piece interior cabinet, which rests inside on the window sill, is of polystyrene plastic. Since there is no metal, operation



is quiet, according to the manufacturer. The grille is in four sections which may be used singly to choose any directional flow of air desired — up, down, to the right or left — or in any combination. Thermostatic control is standard in the 1 hp model, optional in the ¾ hp model. AA 20

Serially Numbered Metal Identification Plates

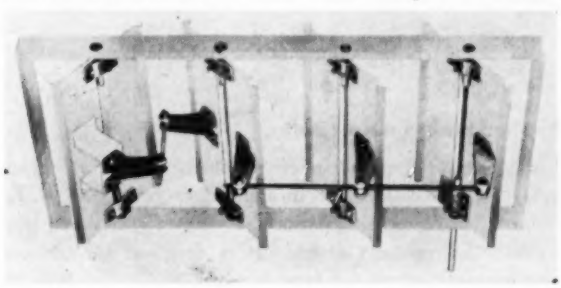
TWO NEW types of adhesive-backed inventory control and equipment identification plates — Metalcraft, Inc., Mason City, Ia. Serially numbered Autographs contain advertising copy lithographed in two colors, plus serial numbers in any sequence desired. Numbergraphs bear stamped serial numbers only. AA 21

Motor Fans

SERIES LU aluminum, one piece, unit bearing motor fans in three sizes: 7¾, 8¾ and 10 in. diameters — Torrington Mfg. Co., Torrington, Conn. Designed especially for refrigeration and air conditioning appliances, fans are hand set for accurate forming and blade alignment, the company states. The series is pierced for all unit-bearing motors. AA 22

Damper Hardware Kit

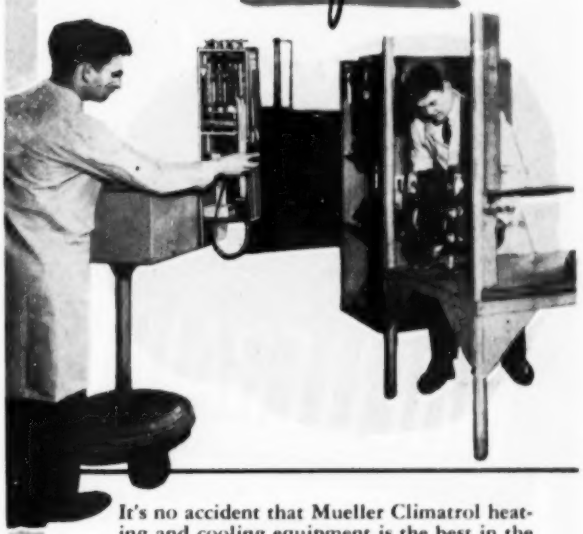
DURO BLADE kit of damper hardware for use by fabricators and installers of multi-blade dampers — Duro-



Dyne Corp., Hempstead, L.I., N.Y. The kit consists of several parts. The automatic self aligning bracket is self centering, assuring smooth, non-binding operation and permitting rapid assembly, the company states. Also

Advanced Engineering makes sure each

Mueller Climatrol *is Right!*



It's no accident that Mueller Climatrol heating and cooling equipment is the best in the industry. It's planned that way.

From the first stroke on the drawing board — through to the finished product, Mueller's *advanced engineering* backs up the factory workers who assemble Mueller units. Add the vital sales and installation experience *you* supply and you have a combination that assures your customers more comfort, economy, and satisfaction when they buy Mueller from you.

Our engineers work in modern laboratories. They have a top-notch experimental department and access to an up-to-the-minute library on heating-equipment sales and production. These men have ability, experience, and know-how.

Proof of Mueller's advanced engineering superiority is the *fact* — not just the *claim* — that Mueller units are the most often copied in the industry. To us, this sincere flattery is only another indication that Mueller Climatrol is the Big Name in Heating.

You, too, can become the Big Name in Heating in your area. Write us, on your letterhead, asking about Mueller dealerships available to qualified concerns.

L. J. MUELLER FURNACE CO.
2030C W. Oklahoma Ave., Milwaukee 15, Wis.

D-142

96th Anniversary

Mueller Climatrol

new
improved line
MUELLERAIRE
FURNACE PIPE,
DUCT AND FITTINGS
For More Sales — More Profits
Here's the line of Furnace Pipe, Duct and Fittings that can make your jobs more profitable. It's MUELLERAIRE — quality-built by Mueller Climatrol and precision engineered to ADI standards.
New features in the MUELLERAIRE line include snap-lock pipe, small pipe and perimeter fittings, and an exclusive stackhead for perimeter wall registers that greatly reduces roughing-in time.
There are many other good reasons why it will pay you to use MUELLERAIRE Furnace Pipe, Duct and Fittings on all your jobs. Check with your wholesaler, or write L. J. Mueller Furnace Company, 2005 West Oklahoma Avenue, Milwaukee 15, Wis.
HOT OFF THE PRESS
Get your copy of the brand new, colorful 28-page Muelleraire Furnace Pipe, Duct and Fittings catalog. Available now. Use the handy coupon.
Mueller Climatrol
MUELLERAIRE
FURNACE PIPE DUCT AND FITTINGS
L. J. MUELLER FURNACE CO.
2030C W. Oklahoma Ave.
Milwaukee 15, Wis.
I'm interested in the Muelleraire line of Furnace Pipe, Duct, and Fittings. Please send me your new catalog.
Name
Company
Address
City ( ) State

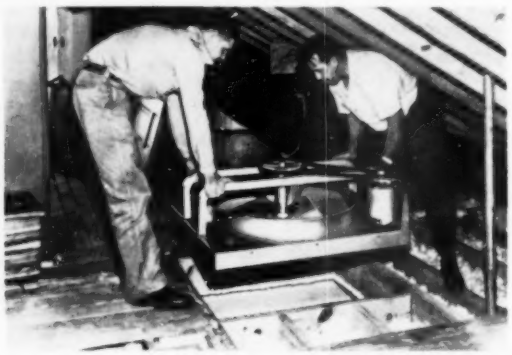
included are self-oiling bushings which "tap-fit" into the frame. Parts which are attached to the blade can be screwed, bolted, riveted, welded or spotwelded as individual shop methods require. The brackets are designed to fit all blades 3 in. or wider and to operate equally well on either parallel or opposed action dampers. AA 23

Forced Air Furnace

JET-AIRE forced air furnace for small homes, with new die-formed, dimpled steel combustion chamber that is welded gas tight — Royal Heaters, Inc., Alhambra, Calif. Hot spots and deterioration of the combustion chamber are eliminated, according to the manufacturer. Housed in an outer case of 20 gage metal, the unit stands 72 in. high and occupies a floor space of 18 x 20½ in. It is approved for zero clearance. The factory assembled control panel with concealed wiring is intended to simplify correct installation. The rubber mounted motor and blower are intended to assure quiet operation. Other features include blower speed control, removable fiber glass filters, etc. The unit is now available in sizes of 75,000, 85,000, 105,000, and 130,000 Btu input. AA 24

Packaged Attic Fan

PACKAGED ATTIC FAN which requires 18 in. attic clearance, and needs only a ceiling opening and adequate exhaust areas for installation — Hunter Fan and Ventilating Co., Memphis. A rubber cushion provides an air seal and insulation between the fan frame and the floor.



In new construction, the fan can be installed in less than an hour, the manufacturer states. It is available in three sizes, with air ratings of 5000 cfm for the 24 in. fan, 7000 cfm for the 30 in. fan, and 10,500 cfm for the 36 in. fan. The ceiling shutter opens and closes automatically as the fan is turned on or off. AA 25

Rubber Transmission Belt

DRIVESALL RUBBER transmission belt made with all-rayon fabric, designed for strength and longer flex life — B. F. Goodrich Co., Akron. Tests show the belt to have less stretch, the company states. It is designed for use on medium duty drives for fans, blowers, etc. AA 26

Electrode Holder

COOLTONG 400 AMP insulated electrode holder designed to give cooler operation — The Lincoln Electric Co.,

WINKLER

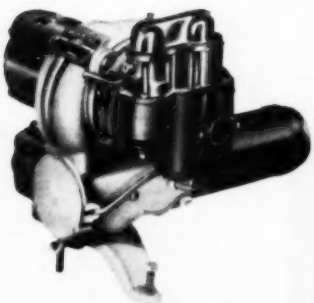
AUTOMATIC HEATING EQUIPMENT

now becomes

A PRODUCT OF

SW

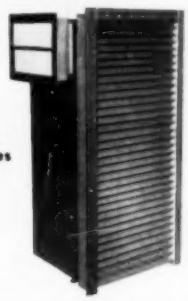
STEWART WARNER



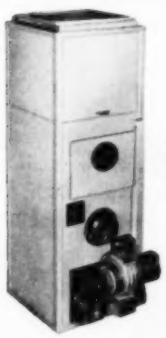
Low and high pressure oil burners

Gas conversion burners

Oil and gas-fired furnaces



Oil and gas-fired wall furnaces



Oil and gas-fired Universal furnaces

Oil-fired cast iron and steel boilers

Two famous names join for greater benefits to all

Effective January 8th, 1953, the U. S. Machine Corporation, makers of Winkler Automatic Heating Equipment, became a division of the Stewart-Warner Corporation. The present Winkler management and sales organization, however, will continue to function as before.

Mutual interests are well served by this consolidation. Winkler has recognized the need for expanded production facilities to handle the growing demand for its products...the combined plant capacities of the two companies will permit this expansion in a sound, efficient manner.

The advantages to present and future Winkler dealers are well defined. A larger and improved line of products...better deliveries ...and a stepped-up advertising and sales promotion program are a few of the indicated benefits.

The products illustrated here represent the basic units of the line...a diversified group which permits Winkler dealers to satisfy virtually all home heating requirements.

A Winkler dealership today offers bigger opportunities than ever—write for details on how to obtain this valuable franchise.

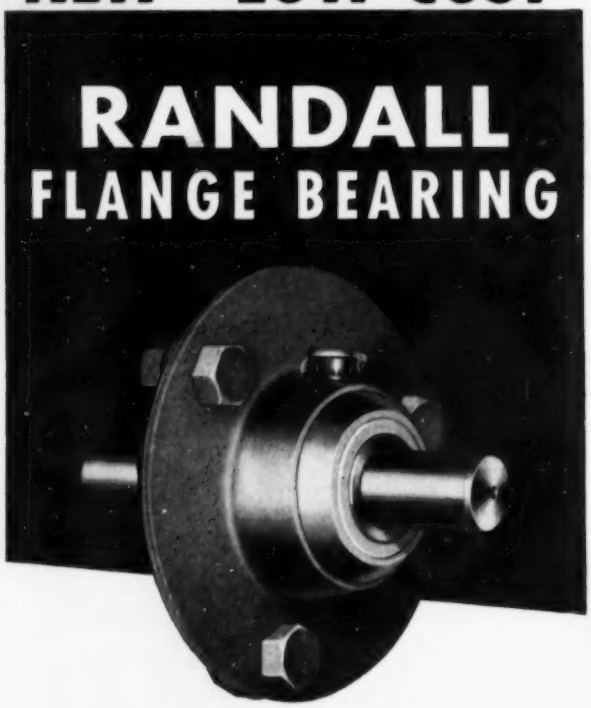
STEWART-WARNER CORPORATION

U. S. MACHINE DIVISION • Dept. A-33, Lebanon, Ind.

• AUTOMATIC •
WINKLER
HEATING EQUIPMENT

NEW—LOW COST

RANDALL FLANGE BEARING



SPECIALLY DESIGNED for LIGHTWEIGHT FABRICATIONS

Compact and light in weight, this new, low cost, flange sleeve bearing unit is easy to install. Fast assembly—true alignment of shaft in all directions—self lubrication—low cost maintenance and extra long bearing life, are just a few of its many outstanding advantages.

Ideal applications are Grain Machinery—Conveyors—Packaging Machinery—Air Moving Equipment and Agricultural Implements.

This new unit is available with sintered bushings for normal duty or with patented Randall Graphited Bronze bushings for heavy duty applications. Shaft sizes available are ½"—⅝"—¾"—15/16" and 1". Special pre-packed, sealed for life, bearings are also available for operating temperatures from —10°F to +140°F.

Ask your distributor for more information on this new bearing assembly today, or write direct to our office.

SEND OUT CATALOG In

BRONZE BAR STOCK
BRONZE BUSHINGS
PILLOW BLOCKS
SHEET LUBRICATOR

Randall

GRAPHITED BEARINGS
THRUST WASHERS
BRONZE CASTING
SAFETY COLLARS

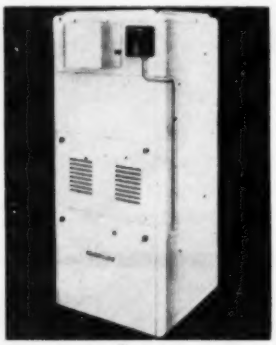
RANDALL GRAPHITE BEARINGS, INC.

1007 S. GREENLAWN AVE. LIMA, OHIO

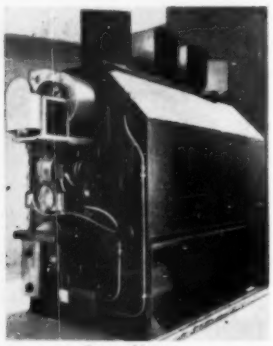
Cleveland. The nose consists of a copper core between four and six layers of laminated, glass-impregnated, plastic cloth. The copper core dissipates heat so that it will not concentrate in the nose where it might cause deterioration of the insulation. AA 27

Gas-Fired Furnace

MODEL G-805 gas-fired furnace, with 100,000 Btu input, which stands 60 in. high — Perfection Stove Co., Cleveland. It is specifically designed for basement or utility room installation. The company has also developed a new self-contained air conditioning unit which is a matched companion piece for the furnace, creating a year 'round conditioning plant when the two are used in combination. All controls in this automatic furnace are factory-installed. Return air connections may be made at either the right or left side or at bottom. The single port upshot type burner is designed for quiet operation, and utilizes natural, manufactured or bottled gases. AA 28



Furnace



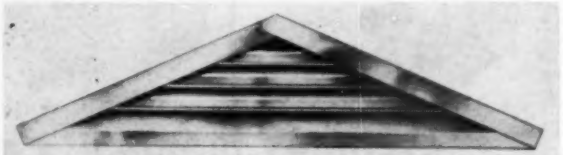
Space Heater

Direct Fired Heater

MODEL H self-contained, automatically operated large space heater available in 12 sizes ranging in output from 200,000 to 2,000,000 Btu per hr — National Heater Co., St. Paul. Four way heat discharge heads and floor line return air grilles provide comfort by controlling the direction and extent of heated air circulation. Heat exchangers are of welded, one-piece construction, and utilize the direct flame-metal-air principle. Units are designed for light oil, heavy oil, gas or combination gas-oil firing. AA 29

Ventilators

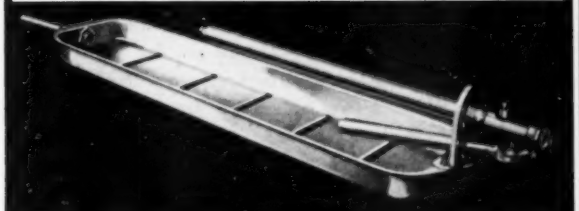
LEIGH GIANT Triangle large size assembled ventilator designed to give adequate ventilation on low pitch roofs — Air Control Products, Inc., Coopersville, Mich. It is built in three opening widths: 90 in., 69 in., and 47 in.,



which are 18¾, 14½ and 9¾ in. high, respectively. Louvers are held to the side frame with tabs, and are

MORE PROFITABLE TO INSTALL

THERMO-DRIP *Automatic* HUMIDIFIER



- VALVES DON'T LIME UP
- SUPER-SENSITIVE THERMOSTAT
- NO STAGNANT POOL TO REHEAT
- OUTSIDE SCREW ADJUSTER
- EASY INSTALLATION
- ONE KIT TO PURCHASE

Our volume sales prove it... Thermo-Drip gives furnace owners greater customer satisfaction.

Prospects easily see the advantages of humidifying by automatically dropping water on a sizzling hot stainless steel pan.

Too, it's easy to demonstrate why this method is the *most efficient, most dependable* way to put moisture in the air.

Yes—Thermo-Drip gives *faster, most efficient vaporization.*

Write today for FREE literature. Dept. A-33

Automatic Humidifier Co.
CEDAR FALLS, IOWA

NEW LOW COST HACKER

STANDARD HEATING EQUIPMENT CO.
WATERLOO, IOWA

CABINET OIL BURNING FURNACE

AFTER FIVE YEARS OF EFFICIENT OPERATION, OWNERS EVERYWHERE ARE ENTHUSED OVER THE *QUIET OPERATION* AND THE *LOW FUEL BILLS*

- HEAVY STEEL BODY... WELDED CABINET
- FOUR SECTION PREHEAT CHAMBER
- AIR FILTER EXPANDED FIBRE 20" x 25"
- ¼ H.P. MOTOR WITH VARIABLE SPEED PULLEY
- 12" WHEEL BLOWER
- RETURN AIR INLET 16½" x 16⅛"
- WARM AIR OUTLET 16½" x 22"
- GUN TYPE BURNER
- STAINLESS STEEL COMBUSTION CHAMBER
- BAKED METALESANT CABINET FINISH

Here is the furnace that will get you the contract. Keep your *cost low* when bidding gets tight. Dealers everywhere are making an *excellent* profit even against the most vicious competition. Shipped completely assembled for *lowest installation cost.*

MAIL COUPON TODAY!

FREE LITERATURE

Standard Heating Equipment Company
Waterloo, Iowa

Gentlemen: Rush me complete money saving facts on the new Hacker oil-burning furnace.

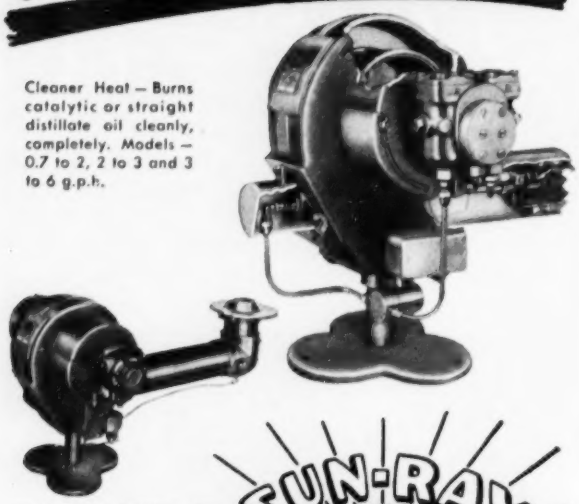
NAME _____

ADDRESS _____

CITY _____ STATE _____

Greatest Oil Heating Improvement in Years

Cuts Heating Costs up to 36%



Cleaner Heat — Burns catalytic or straight distillate oil cleanly, completely. Models — 0.7 to 2, 2 to 3 and 3 to 6 g.p.h.

SUN-RAY SERIES S OIL BURNERS

Model "VS" Vertical Flame Burner for round boilers and furnaces too inefficient to fire with conventional burners. No combustion chamber or complicated hearth; no moving parts in firing area. Models—0.7 to 2 and 2 to 3 g.p.h.

PUT YOU WAY AHEAD WITH THESE EXTRA SELLING VALUES

"Shell" Combustion Head — the famous dual carburetor that atomizes every particle of oil for most efficient combustion.

Sun-Ray Aerodynamic Housing — provides smooth, metered air flow for complete combustion and quiet operation.

Built-in Delayed Action Oil Brake — delays oil flow to nozzle until air supply is at full capacity, assuring correct oil-air mixture. At the end of firing cycle, oil supply is cut off instantly, preventing smoky starts, after-drip, odor, soot and pulsation.

Precision Construction — components of finest quality; expert assembly and testing to exacting standards.

Top Performance — highest CO_2; lower stack temperature; 500° to 600° F. higher flame temperature; lower fuel consumption.

Get the Facts Today

SUN-RAY BURNER MFG. CORP.

139-34 Queens Boulevard • Jamaica 2, N. Y.

designed to keep out snow and rain, and to provide added stiffness which prevents rattle. The ventilators are available in aluminum or steel. AA 30

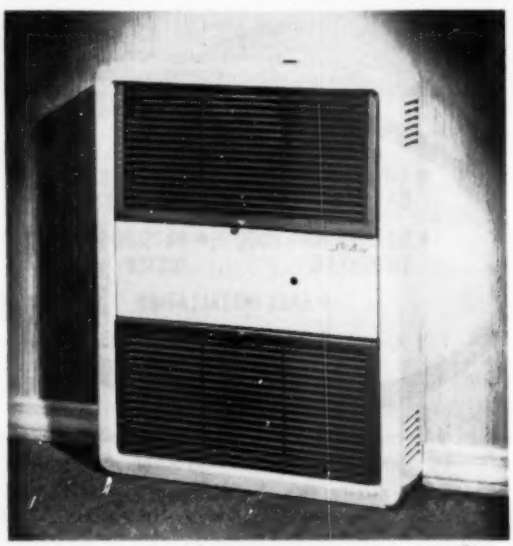
Attic Fan

No. 822 ATTIC fan, a 22 in. fan designed especially for small homes, cottages and motels — Viking Air Conditioning Corp., Cleveland. No suction box or other special construction is necessary because the fan discharges

vertically. It is compact enough to fit into truss spacing in small homes built with prefabricated trusses for roof support. AA 31

Wall Heaters

REDESIGNED LINE of Saf-Aire Saftey-Sealed wall heaters, now including a new 30,000 Btu per hr input gravity model, and a recessed wall furnace with 70,000 Btu per hr input, which burns either gas or oil fuels, and is



intended for use with perimeter systems — Stewart-Warner Corp., South Wind Div., Indianapolis. In the gravity models, gas fuel is burned within a sealed chamber, the combustion chamber being vented through the wall to a vent on the outside. The heaters may be installed in homes without basements. AA 32

Value-wise Housewives appraise *and praise*

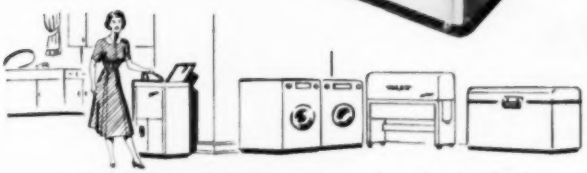
The **NEW** *Majestic* Indoor Incinerator!

GAS OR FUELLESS TYPES

THREE MODELS IN ONE UNIT

USES SMALL DISPLAY SPACE

CUTS DOWN ON INVENTORY NEEDS



Here's your No. 1 profit-maker for '53! The biggest home-appliance value you can offer the thrifty housewife! And *it* isn't hard to sell . . . *she'll* quickly see it's the *real* answer to the garbage nuisance!

How's this for a perfect sales picture? Automatic heating prevents burning refuse in the furnace. So almost every home needs a *new* Majestic Incinerator! All your past heating customers are prospects . . . and you already have the list! With low inventory you can offer a choice of three models — fuelless, and AGA-approved gas and automatic gas. Any model gets rid of *all* wet and dry garbage and trash-burner waste! Household refuse is simply loaded in unit 'til full; then ignited! Patented downdraft design, Jet-Air Action dry contents before and during burning! Easily connects to furnace flue in kitchen, basement, utility room. No grinding or grating . . . no moving parts to jam or wear! White enamel finish . . . compact, modern design blends nicely with other appliances. Ideal tie-in on new furnace sales or call backs. Write for full details today! Or contact your jobber.

Today's Most-talked-about Chore-Saver!

The *Majestic* Co., Inc.

110-A Erie Street Huntington, Indiana

ARE YOU GETTING YOUR SHARE OF THE TERNE METAL ROOFING BUSINESS?

There are lots of dollars lying around—dollars you can pick up by selling Follansbee Terne Metal Roofs, and by using Follansbee Terne Metal for your roof repair jobs.

To help you get this profitable metal roofing business, Follansbee is maintaining a consistent sales promotion and advertising program. *But*, it's up to *you* to go after these roofing contracts—it's up to you to tell your customers about the many advantages of Follansbee Terne Metal—

- how tightly and permanently it seals the weather outside where it belongs.
- how it protects against fire.
- how it resists high winds, and extreme temperature.
- how the color of the roof can be changed to match exterior trim.

. . . and here's more good news—40 lb. coated Follansbee Terne Metal Roofing is available once again in convenient 50-foot continuous seamless rolls for every roof and weathersealing need. Now you can get your share of these profitable metal roofing contracts in every kind of housing. If you're not getting your share, perhaps we can help you.

FOLLANSBEE STEEL CORPORATION

GENERAL OFFICES, PITTSBURGH 30, PA.

COLD ROLLED STRIP — SEAMLESS TERNE ROLL ROOFING
POLISHED BLUE SHEETS AND COILS

Sales Offices—New York, Philadelphia, Rochester, Cleveland, Detroit, Milwaukee. *Sales Agents*—Chicago, Indianapolis, Kansas City, Nashville, Los Angeles, San Francisco, Seattle; Toronto and Montreal, Canada. *Mills*—Follansbee, W. Va.

FOLLANSBEE METAL WAREHOUSES
Pittsburgh, Pa. Rochester, N.Y. Fairfield, Conn.

NEW LITERATURE

3-53

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We will ask the manufacturer to send you the literature described.

Be sure to circle the items which you wish.

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Mail to AMERICAN ARTISAN, 6 N. Michigan Ave., Chicago 2, Ill.

Patterned Structural Metals

GENERAL PRODUCTS FOLDER (six pages) describes Rigidtex metals, with "clear-through" designs of different types intended to make the metal stronger and more attractive — Rigidized Metals Corp., Buffalo 3. The metals are available in various ferrous and non-ferrous types, in sheet or strip, coils or cut lengths, solid or perforated, and in over 25 patterns. Brief fabrication data is included. AA 101

Belt-Drive Blowers

CATALOG B-10 covers belt-drive utility blowers in sizes from 9 to 30 in. — Hartzell Propeller Fan Co., Piqua, Ohio. Detailed specifications and complete air delivery tables are included. The blowers are equipped with adjustable motor pulleys for varied speed. AA 102

Warm Air Heating Equipment

CATALOG-PRICE list No. 52 lists a complete line of warm air heating equipment and accessories — The Majestic Co., Huntington, Ind. All pipe and fittings have new numbers, as the company is cooperating in standardizing fitting numbers as recommended by the Air Distribution Institute. Also available is the new dealers' discount sheet No. 52. Equipment covered includes furnaces, gas burners and accessories, humidifiers, motors, oil burners and accessories, oil tanks, pipe and fittings, plenum bases, registers, etc. AA 103

Vibration Isolation Pads

A CATALOG INSERT describes Keldur vibration isolation pads and illustrates several applications — Hobsite Products Co., Harrison, N. J. The material is used to reduce vibration transmission to or from a variety of equipment.

Amazing New

Improved BETT-MARR

actually outperforms saws costing 6 times as much

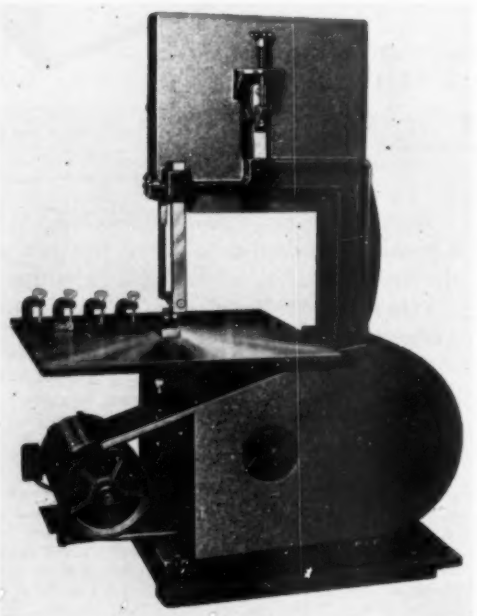
For faster, smoother, more accurate cutting of galvanized sheet metal, there's nothing better than a Bett-Marr—yet, it actually costs so little, no shop can afford to be without one.

The all-cast frame of the new, improved Model 14 MS assures the utmost in stability and accuracy and reduces vibration to a minimum.

CUTS 50 to 70 STACKED SHEETS—of galvanized sheet metal up to 15 inches per minute. An all purpose 14 inch bandsaw with lifetime sealed precision bearings.

SMOOTH, POWERFUL CHAIN DRIVE—Blade speeds from 125 to 2200 FPM quickly adjustable for metals, plastics, wood, castings or forgings.

POSITIVE BLADE CONTROL—Case hardened guides with carbon back-up bearing (adjustable up to ½" blade width) assure accuracy. Flanged wheels control blade for perfect radius and straight line cuts.



BETT-MARR MFG. CO. HOPKINS, MINNESOTA

☐ Please send me more information on the Bett-Marr sheet metal saw

☐ Where can I buy a Bett-Marr

Name .....

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City ..... Zone ..... State .....

Shown above MODEL 14 MS*

Depth of Cut 8¼
Blade to Frame 13½
Table Size 20x22
Overall Depth 34"
Blade Length 97"

*Includes set of 4 sheet metal clamps and riser bar insert to match for sheet metal work.

MAIL COUPON TODAY . . . GET THE AMAZING FACTS

Learn how you can cut production costs with a Bett-Marr sheet metal saw. It pays for itself quickly in both large and small shops. (Equipment dealers—write for information on available territories.)

try the simpler way— just use P-K hardened

MASONRY NAILS

for making fastenings to brick, mortar, concrete, etc.

You'll save work, as well as time and money by using P-K* Hardened Masonry Nails. Just hammer them in — they hold securely, and are easier, quicker, and cheaper to use than expansion bolts, lead anchors and plugs, and similar devices.

In comparatively soft masonry they can be driven without the necessity of drilling lead holes. For hard masonry, make pilot holes with a P-K Masonry Drill.

First time you try them, you'll agree that P-K Masonry Nails are the job-speeders you've been looking for. Available everywhere through accredited Distributors. Remember . . . IF IT'S P-K, IT'S O.K.

PARKER-KALON*

FASTENING DEVICES

Makers of the Original Self-tapping Screws

Write for this folder

Gives sizes, punch information, full instructions for use. Tells you the many ways Masonry Nails will help you save time and money. Parker-Kalon Corporation, 200 Varick Street, New York 14, N. Y.

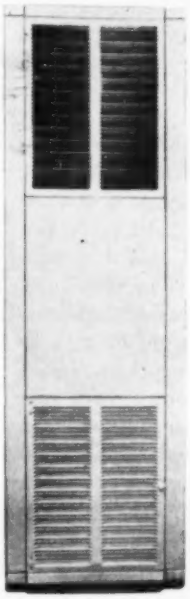
*TRADE MARKS REG. U.S. PAT. OFF.

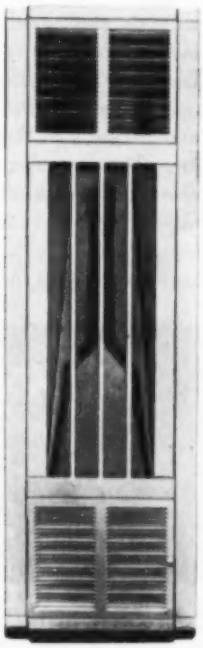
JOHN ZINK JZ

WALL HEATERS

A better designed gas burning unit for home heating —

LOUVER *or* **RADIANT** *types*





AGA Approved for Natural, Manufactured Mixed or LPG.

★ **ATTRACTIVE**
Easy to sell

★ **DESIGNED RIGHT**
More heat per dollar

★ **EASY TO INSTALL in**
new or remodeling jobs

John Zink's newest improved W25 Wall Heater has 25,000 B.T.U. input rating. Simplified installation requirements make them ideal units for use in small homes, extra rooms, garages, utility rooms and basements. Ideal for modernizing old homes as well as in new construction. Only 57½ inches high and installs between 16 inch centers.

Can be furnished with 100% safety pilot or with standard blue flame pilot on natural gas.

Be Profit Wise — Show and Sell John Zink Heaters.

— Write —

JOHN ZINK CO.

4401 So. Peoria **TULSA, OKLA.**

including air conditioning ducts, motors, power presses and precision instruments. It is available in sheets 36 in. square, ¼, ⅜ and ½ in. thick, or can be cut to specifications. AA 104

Vaneaxial Fans

AXIVANE SERIES 1000 fans, consisting of 136 models ranging from 18 to 84 in. in diameter and producing volumes up to 150,000 cfm at total pressures as high as 11.0 in. wg are described in Bulletin J-611 (16 pages) — Joy Mfg. Co., Pittsburgh. Fans are available in 19 housing diameters, four hub sizes and five motor speeds. Photographs of typical installations are included in the bulletin, as well as information about special duty units. AA 105

Magnet Applications

AN INFORMATION KIT describing permanent magnet application ideas for industry consists of a heavy binder with six application ideas, each described on a separate loose leaf page — Carboloy Dept., General Electric Co., Detroit. Each month, the department plans to issue a new magnet application sheet which will be distributed automatically to those who request the basic information kit. The first ideas presented are: use of magnets as sheet steel separators, as floor sweepers to pick up ferrous objects and as racks for small shop tools. Each idea sheet contains complete technical information and diagrams regarding the application described. AA 106

Heating and Air Conditioning Specialties

CATALOG FORM Gen. 3 describes a complete line of heating and air conditioning specialties — Maid-O'Mist, Inc., Chicago. Also available now are convector humidifier counter display cards and window posters. AA 107

Sheet Metal Fasteners

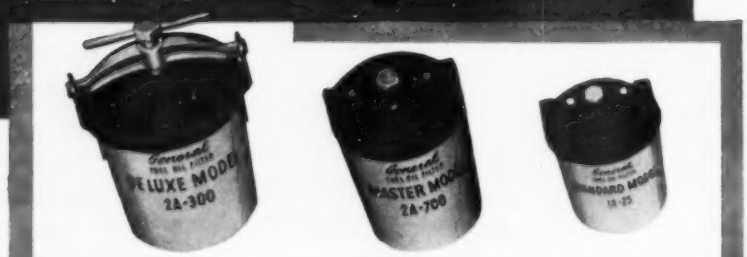
CATALOG 1252 (36 pages) covers a complete, expanded line of fasteners which are suited for panel fastening in sheet metal cabinet work and for similar applications — Simmons Fastener Corp., Albany. The catalog contains dimensional drawings, engineering data, installation details, etc., and illustrates applications of each fastener type. AA 108

Flue Pipe and Gas Vent

CATALOG AV-1 illustrates and describes Amerivent double wall, aluminum Type B flue pipe for gas applications — American Metal Products Co., Inc., Los Angeles. Dimensions and sizes of round type flue pipe and fittings are given, and ells, tees, reducers, connectors, etc., are illustrated. The pipe has a ½ in. circulating air space between the inner and outer layer. It may be installed 1 in. from combustible material, the company states. No screws, mastic or cement are required for installation. The oval type flue pipe also described is approved as a wall vent when combined with special plate spacers. AA 109

General FUEL OIL FILTERS
For Any Fuel Oil Heating Plant

Easy, Sure Service Profit
Wherever Fuel Oil Is Used



You can be sure of *continuous* profit when you install a GENERAL. Wherever fuel oil is used, GENERALS prevent clogged burner nozzles, provide clean, steady oil heat, and insure quick cartridge replacements that mean easy service dollars for you

- Easy cartridge replacements each season.
- No more troublesome service "call-backs."
- Satisfied fuel oil customers year 'round.

DELUXE MODEL 2A-300	MASTER MODEL 2A-700	STANDARD MODEL 1A-25
For BIG DIRTY TANKS	For MEDIUM NEEDS	For SMALL HOMES, SPACE HEATERS, ETC.

FASTEST, SUREST FILTERING KNOWN
CLOGGED BURNER NOZZLES ELIMINATED
ALL-WOOL CARTRIDGE TRAPS FINEST PARTICLES
JUST TWO PIPE CONNECTIONS REQUIRED

CLEAN RIGHT SOOT REMOVER
Soot deposits also raise fuel costs! Clean Right burns safely, gently—leaves no residue. Made for General Filters, Inc.

General Filters carry this Underwriters' Laboratories Seal

GENERAL FILTERS INCORPORATED
12890 WESTWOOD AVENUE
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"Most Valuable"

in PRODUCING SALES

Sundstrand
All Electric
OIL BURNER

Such integral values as design, construction and performance give the Sundstrand line selling power backed by consumer acceptance.

The public hears about Sundstrand. They see Sundstrand. They buy Sundstrand.

Because: Ultimate heating satisfaction means having an oil burner with

★ *DURABILITY*
★ *DEPENDABILITY*
★ *COMPACT DESIGN*
★ *OVERALL ECONOMY*
★ *QUIET OPERATION*

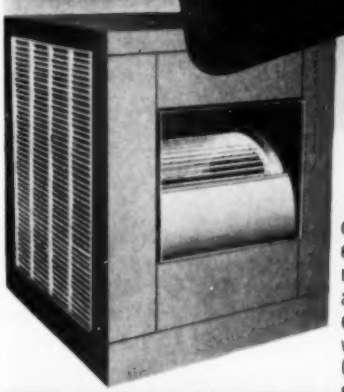
These salient features result from 32 years of engineering and development by Sundstrand. Available is a complete line of oil burners for new installations or conversion. To increase *your* sales with Sundstrand,

write to —

SUNDSTRAND ENGINEERING CO.
ROCKFORD, ILLINOIS

Higher Cooling Efficiency At Lower Cost With . . .

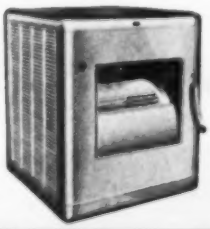
CHILL-AIR
EVAPORATIVE COOLERS



INDUSTRIAL COOLERS

Model No.	CFM	HP	Cu. Ft. of Space to be Cooled
80P	7800	¾	5,000 to 11,000
100P	9600	1	7,000 to 15,000
125P	12500	1½	9,000 to 20,000
150P	15000	2	15,000 to 30,000

Above Motors 110, 220 Volt Single Phase (Three-phase motors available on order)



COMMERCIAL COOLERS

Model No.	CFM	HP	Cu. Ft. of Space to be Cooled
33	3300	⅓	2,500 to 3,000
40	4000	⅓	2,500 to 3,500
45P	4500	½	3,000 to 4,000
60P	5800	½	3,500 to 5,000
70P	6800	¾	3,500 to 6,000

⅓ and ½ H.P. Motor 110 Volt Single Phase
¾ H.P. Motor 110-220 Volt Single Phase

Lower installation and operating expense, easier servicing and maintenance, plus top cooling and air movement efficiency, are the reasons why Chill-Air Evaporative Coolers have been so popular with contractors and building owners over the past 20 years.

Chill-Air Commercial and Industrial Coolers are designed for easy installation on the roof or side of building. Standard models are available for reducing temperatures 12-18° in spaces ranging from 2,500 to 30,000 cubic feet. Larger sizes built to order.

The Chill-Air patented odorless and sag-proof evaporative pads are easily removable for cleaning. The 110-220 v. motor can be oiled and serviced by simply removing pads. Uniform, non-clog water distribution troughs assure maximum evaporative surface — and the simple, trouble-free recirculating pump system eliminates water waste.

Free Engineering Service

Write for Free Descriptive Literature

National Engineering & Mfg. Co.
519 Wyandotte
Kansas City, Mo.

we hear that . . .

FOLLANSBEE METAL WAREHOUSES recently had an exhibit of sheet metal working machines at its Rochester, N. Y., warehouse. Machines on display included foot shears, power tables, bar folders, and squaring shears.

REPRESENTATIVES of more than 200 firms attended the exhibit of sheet metal working machines held at the Rochester, N. Y., warehouse of Follansbee Steel Corp.

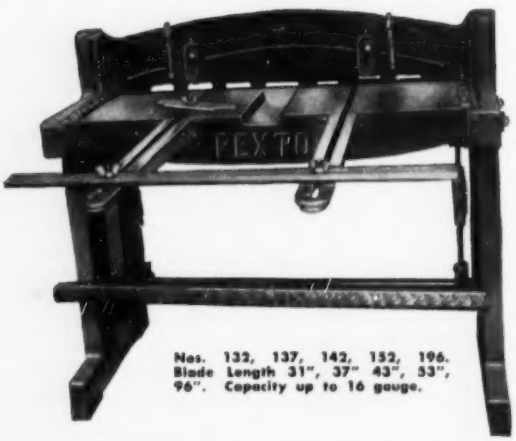
Raymond Bolton was in charge of the exhibit, and trained personnel were on hand to demonstrate the operation of the machines.

PENN CONTROLS, INC., is presenting a series of educational shows, designed as a service to heating and refrigeration engineers and servicemen, in several of the western states. Shows covering the function and operation of heating controls are scheduled to appear in the following cities: Oakland, March 23; Portland, March 30; Seattle, April 1; Victoria, B. C., April 6; Vancouver, B. C., April 7; Spokane, April 13; Salt Lake City, April 16; Denver, April 20; Wichita, April 23; and Kansas City, April 27. Refrigeration control shows will be given in the following cities: Oakland, March 24; San Francisco, March 25; Sacramento, March 26; Portland, March 31; Seattle, April 2; Vancouver, B. C., April 8; Spokane, April 10; Salt Lake City, April 17; Denver, April 21; Wichita, April 24; and Kansas City, April 27. Giant controls will be demonstrated, and colored slides, charts, etc., will be used. Meetings are being arranged in each city by the company's local jobbers.

M. B. SMITH, merchandiser of coal, oil, and gas heating equipment, has moved into a new office-show-room-warehouse building at Camp Hill, Pa.

THE REGIONAL and home office sales personnel of the Airtemp Div., Chrysler Corp., recently held a three-day sales conference at Dayton. The meeting ended on the note that 1953 promises to be the year of the air conditioning industry's most intensive selling effort. The

PEXTO...Best Buy in SQUARING SHEARS



Nos. 132, 137, 142, 152, 196. Blade Length 31", 37" 43", 53", 96". Capacity up to 16 gauge.

Designed* for easy accurate cutting.

Available in sizes from 30" to 96".

Furnished complete with Front Gauge, Bevel Gauge, Graduated adjustable side Gauge and the famous PEXTO Rack and Pinion graduated precision Back Gauge.

* Design Pat. DES 157,611.

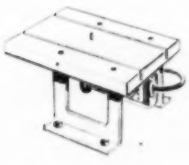
THE PECK, STOW & WILCOX CO. — since 1785 — **Southington, Connecticut, U.S.A.**

Cut all installation holes faster

ONLY $49.50 Complete with 5 different blades

Makes short work of cutting openings in ducts for registers.

Perfect for cutting holes in floors and walls for running pipes.



Accessory Table converts Jig Saw to bench use . . . only $14.95.

with this NEW Black & Decker Utility *PORTABLE* JIG SAW

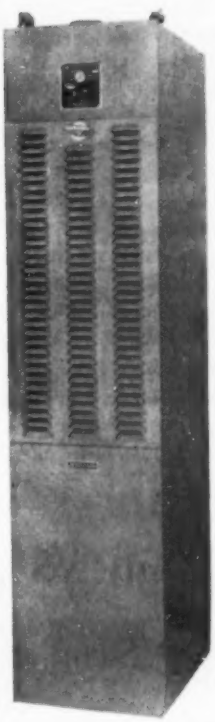
Here's a new Black & Decker tool to help speed all your installation work — the B&D Utility Portable Jig Saw! It's perfect for cutting holes in floors and walls to run pipes and ducts . . . it makes short work of cutting openings in ducts for registers! And it will make any cut — straight or irregular — in sheet metal and boards of all types! Needs no "entrance hole" when making pocket cuts in wood or wallboard — the sabre blade cuts its own! And the best part of all is that the price on this new tool, complete with 5 blades to cut most every material known, is considerably less than you expect for this quality. See and try the Black & Decker Utility Jig Saw today at your favorite Black & Decker outlet. For free catalog, write to: THE BLACK & DECKER MFG. CO., Dept. 641, Towson 4, Md.

Black & Decker
UTILITY TOOLS
PORTABLE ELECTRIC TOOLS

JOHN ZINK JZ

HEAT MAKERS

for your customers



- EASY to SELL
- EASY to INSTALL
- Standard Units
  Trouble free Heating
  AGA Approved

Burn ALL GASES

CENTRAL HEATERS

Upright or horizontal models are available in a complete packaged unit with fully automatic controls. Provide forced, filtered air heating with no attention. All heaters completely assembled and checked at factory. Several sizes available.

Made entirely by John Zink—
guaranteed by John Zink.

WALL HEATERS

John Zink's new Wall Heaters in louver or radiant type are a smaller more compact heater—designed for installation between 16" centers—recesses wall into the wall.

Particularly adapted for heating small, low cost homes, extra rooms, garages, utility rooms and basements.

Attractively finished in ivory color that will not chip or crack. Efficient Units you can sell at a profit.

Ask about the new Z2 ATTIC FANS

JOHN ZINK CO.

4401 SO. PEORIA — TULSA, OKLA.

we hear that . . .

company expects greatest individual sales gains in the residential market. According to J. F. Knoff, vice president and general manager, the ultimate market consists of 30,000,000 homes that can be air conditioned.

MARGARET INGELS' new book, *Father of Air Conditioning*, outlines the life of Dr. Willis H. Carrier, and tells the story of the company he founded and the industry he pioneered. Included in the 170 page volume is a chronological table of events (from 1500 to 1952) which led to and furthered modern air conditioning. Also included is a list of books and published articles by Dr. Carrier. The book, published by Country Life Press, Garden City, N. Y., is available from Carrier Corp., Dept. PR 3, 300 S. Geddes St., Syracuse, N. Y. The price is $2.50.

THE COMPLETION of a new open hearth shop and the improvement of existing facilities have increased the steelmaking capacity of Inland Steel Co.'s Indiana Harbor Works from 3,750,000 to 4,500,000 net tons annually.

A PORTABLE dust-spot tester designed to enable engineers, buyers of equipment, and manufacturers to get on-the-job data and efficiency ratings for all types of air filters and air cleaners has been made commercially available by Trion, Inc. The meter was manufactured according to a design originated at the National Bureau of Standards.

WHITING CORP. is moving its St. Louis district sales office to 567 North and South Rd., University City, Mo.

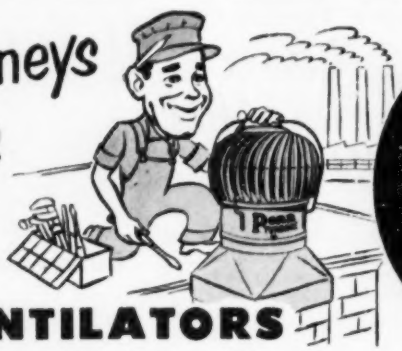
THE HEIL CO. is offering to its authorized dealers a plastic identity sign illuminated from the inside with incandescent bulbs. The individual dealer's name is enameled on a metal plate extending below the sign.

THE A. O. SMITH CORP. has begun construction of a new welding electrode plant at Lancaster, Pa., which is planned for completion by late July. The plant will contain 41,000 sq ft of floor space.

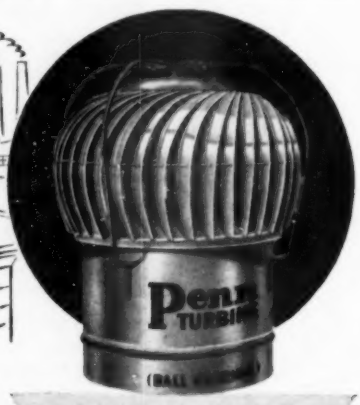
A PLAN which permits users to lease industrial lift and fork trucks and allied equipment instead of buying them has been announced jointly by the Philadelphia Div., Yale & Towne Mfg. Co., and C.I.T. Corp., the industrial financing subsidiary of C.I.T. Financial Corp. This plan enables factories, warehouses, etc., to obtain materials handling equipment by paying monthly rentals as the machines are used.

MITCHELL MFG. CO. has prepared a replica of the Weath'r Dial control panel, fitted into a handy carrying

Cure choked chimneys and faulty flues



with PENN VENTILATORS



PENN TURBINE VENTILATOR

Penn Turbine Ventilators are ruggedly constructed of heavy galvanized steel or copper. They are rust resistant, maintenance-free, automatic. Once installed they require no further attention, care or adjustment.

Improper draft conditions in chimneys and flues can often be corrected by the use of ventilators. The Penn Turbine and Liberty Siphonage ventilators are two products especially well suited for this application.

Liberty® VENTILATOR

All angle wind tests* indicate Ventilator's back-draft control effectiveness. All the air currents — upward, downward, horizontal or swirling are converted into powerful suction forces which accelerate natural drafts in sluggish chimneys. Sizes 6" up.

*United States Testing Co., Inc. Test #E-1532-9/11/50

PENN VENTILATOR COMPANY

Write for complete literature today!

REPRESENTATIVES & DISTRIBUTORS IN PRINCIPAL CITIES

FOR MORE THAN 25 YEARS, THE BUILDERS' ROOF TOP LINE

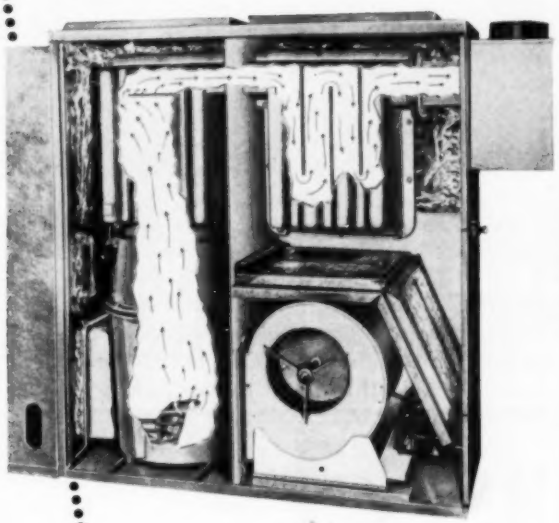
PHILADELPHIA 40, PA.

XXth CENTURY

Announces

THE NEW "SPACE SAVER" MODEL

ZEPH-AIR



The new "Space Saver" Zeph-Air helps heating contractors fill a definite need in today's market. You must be able to supply a furnace to fit the smaller utility areas in present day homes. . .yet there can be no compromise with the heating requirements. That's where we shine with our new "Space-Saver" Zeph-Air. . . .it occupies only 23 x 44 inches of floor space, yet its efficiency will equal or surpass many larger units. The "Space-Saver" Zeph-Air is manufactured in two models — one will supply 110,000 Btu input, the other 123,000 Btu input depending on your requirements. As usual, all cast iron parts carry the famous XXth Century twenty year warranty against cracking or burning out — and it also applies to defects in workmanship or materials.

We think you'll like this addition to our line and would like to send you more information. Please send us a postcard today for more details.

XXth CENTURY
HEATING & VENTILATING CO.
96 IRA AVENUE AKRON, OHIO

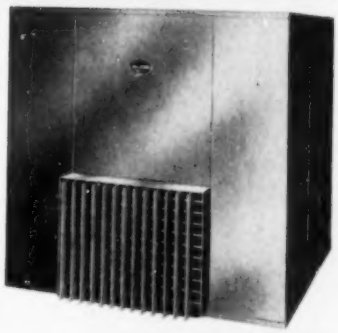
There's Big profits

selling RETAIL STORES

The "RETAIL-preferred"

ALTON

Evaporative Cooler!



Yes, YOU can offer the ALTON-preferred by merchants the nation over for comfort cooling.

. . . . because, we're offering *you* the Alton — the evaporative cooler chosen by over 100 J. C. Penney stores; by retail stores, big and little, independent and chain, all across America! Yes, Alton quality and Alton low price (with a good margin for you) make selling retail stores easy!

These customers too!

Factories	Taverns	Super Markets
Churches	Night Clubs	Bakeries
Theatres	Halls	Beauty Shops
Cafes	Bowling Alleys	Morticians

Here's why they all want the ALTON!

It's economical! The Alton cools by evaporation, not by expensive refrigeration! So the Alton is low in first cost, inexpensive to operate and maintain. And service expense and "call-back" costs are nil! The buyer can afford the Alton!

It's complete! Comes "packaged" — ready to install! No parts missing and no elaborate assembly.

It's quality! **Heavy squirrel-cage blower** moves air quietly, effectively. **Complete Cabinet:** All parts enclosed in galvanized **steel! Turbospray:** the permanently lubricated and water tight pump-spray that 'mists' the water over the whole mat surface — "thoroughly wets". **Two sets of mats:** keeps water contained in airwasher section, out of blower section!

Learn why YOU want ALTON! All details and prices if you mail us this coupon!

ALTON MFG. CO., 1112 Ross, Dallas, Texas

Please send me full information about the Alton Evaporative Cooler. No obligation.

Name .....

Firm Name .....

Address .....

City ..... State .....

they fit your production procedure smoothly

HARDWARE FOR METAL APPLICATIONS

by

NATIONAL LOCK

Hardware for metal applications, designed and engineered to fit your production line procedure with a minimum of time and effort.

FOR USE ON

Humidifiers — Oil Burners
Air Conditioning Equipment
Gas Heating Units — Stokers
Space Heating Units

Advantages of "All From 1 Source" Buying

You are assured of consistent quality for customer satisfaction when you adhere to one-source buying from NATIONAL LOCK. Cost saving in simplified inventory and control, purchasing, and shipping are other advantages. Besides, NATIONAL LOCK provides a wide selection of distinctive designs to meet your every demand. Prompt delivery.

Write for free information

NATIONAL LOCK COMPANY
Rockford • Illinois

we hear that . . .

case, to enable salesmen to demonstrate features of the company's ¾ hp and 1 hp air conditioning units in the prospect's home.

OFFICIALS OF the Boston Machine Works Co. took time off from their duties at the recent International Heating, Ventilating, and Air Conditioning Exposition in Chicago to hold a meeting with the company's factory representatives. All the company's products were reviewed, new items were introduced, and sales policies for 1953 were established.

CANADIAN AND UNITED STATES representatives of the Boston Machine Works Co. enjoy luncheon during the course of their January sales meeting

FOR THE CONVENIENCE of contractors and dealers who need only a few feet more of insulation than a standard package holds, Infra Insulation, Inc., is now offering Types 6H and 4H-16 in. in cartons packing 100, 250, 500, and 1000 sq ft.

J. E. BRUNDAGE, director of engineering, The Brundage Co., was recently elected president of the Foremen's Club of Kalamazoo, an affiliate of the National Association of Foremen.

THE CORY CORP.'s 1953 line of air conditioners will feature an exterior cabinet designed to blend with any room setting. First units are now being produced in the company's plant at Grayslake, Ill.

PLANS FOR THE CONSTRUCTION of a rolling mill on the Pacific coast for the production of aluminum sheets and strips have been announced by the Harvey Machine Co., Inc. Erection of a new plant, which will cost approximately $20 million, will begin as soon as a site is selected.

AFFILIATED GAS EQUIPMENT, INC., has purchased the Toronto Hardware Mfg. Co., Ltd., Toronto. Plans are under way to expand the new Canadian unit's operations in both gas and oil heating equipment.

A 16MM SOUND motion picture has been made by the H. Owens Co., showing the operation of the company's jet pattern developer. Prints showing how a mechanic can lay out sheet metal patterns are available to shops,

NOW WE'RE IN THE *Millions!*

1,000,000th MAXITROL ROLLS OFF THE LINE IN 3½ YEARS

We'll take a bow! Proof to us that the now-famous "Straight-Thru-Flow" of gas principle is a boon-to the industry is our 1,000,000th MAXITROL Gas Pressure Regulator produced in January, 1953, three-and-one-half years after introduction of the new design!

We'll also give a heart-felt "accolade" to an industry that, so readily, accepted the first major change in gas pressure regulators in over 50 years!

MAXITROL Gas Pressure Regulators will be copied in the coming years. We accept the compliment, and the similar compliments bound to come as MAXITROL continues ahead; continues its leadership in imaginative thinking and originality!

Maxitrol IS BEST BY FAR!

DETROIT REGULATOR COMPANY

1742 RIVARD STREET — DETROIT 7, MICHIGAN

Sold on the Pacific Coast by: PACIFIC SCIENTIFIC CO., San Francisco, Los Angeles, Seattle, Portland

EXCELSIOR

THE COMPLETE LINE

Gravity Warm Air and Return Air Fittings

Forced Air Ducts and Fittings for—
Standardized Take-Off System
Extended Plenum System
Perimeter Heating System
Small Pipe High Velocity System

Galvanized Pipe, Elbows and Angles

Stainless Steel Chimney Liners for Gas Heat Installations

Blued and Walnut Stovepipe and Elbows

Gas Diverters and Sheet Metal Specialties

for *"Quality, Service, and Profit"*
Consult Excelsior on Your Requirements

Write for new 1953 Catalog 9A for details and prices on complete line.

ADI STANDARDIZED

THE EXCELSIOR STEEL FURNACE COMPANY

118 S. CLINTON ST. — Phone: FRanklin 2-8120 — CHICAGO 6, ILL.

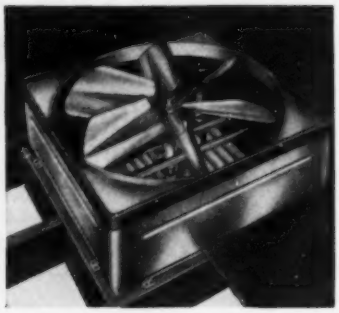
EXCELSIOR HEATER & SUPPLY DIV.
The Excelsior Steel Furnace Company
879 Hersey Ave., St. Paul 4, Minn.
Telephone: NEstor 7255

BREX & BIELER DIV.
The Excelsior Steel Furnace Company
229 Marion St., Brooklyn 33, N. Y.
Telephone: CLenmore 2-7881

EXCELSIOR HEATING SUPPLY DIV.
The Excelsior Steel Furnace Company
528 Delaware St., Kansas City 6, Mo.
Telephone: Victor 3715

REX AIRATE CLIPPER

The Builders Choice



• Here's a big efficient, economical vertical comfort-cooler—a floor mounted packaged unit that meets every need for low cost ventilation in homes, motels, restaurants, garages and small plants.

The Rex AIRATE Clipper is an ideal unit for remodellers and builders—easy to sell, almost service-free, simple to install in either old or new buildings. Four models available with air delivery from 3854 to 10,000 CFM.

MOTOR—Oversize, split-phase motors with overload protectors. Rubber mounted to absorb shock. No radio or TV interference. 60 cycle, A. C., 115 volt operation.

HOUSING—Heavy gauge metal with welded angle stiffeners and tubular re-inforcement brackets. Cushioned in heavy felt.

OPTIONAL CEILING SHUTTER—All steel construction. Positive automatic action. Wood moulding included. Automatically closes in case of fire. Assembly easily accessible from below to permit fan and motor lubrication.

OPTIONAL TIMER—Automatic operating range from 15 minutes to 12 hours. For permanent wiring.

BLADES—Six deep pitched blades that reduce hum usually found in 3 or 4 blade fans of this size. Insure quieter and more powerful operation.

FINISH—A combination green band with gunmetal housing in Hammerloid baked enamel.

CERTIFIED RATING—"Air Deliveries are in accordance with the standard test code for centrifugal and axial fans, and conform with U. S. Department of Commerce Commercial Standard, No. 178-51".

AIR CONTROLS, INC.

Division of the Cleveland Heater Co.

2310 SUPERIOR AVENUE • CLEVELAND, OHIO

we hear that . . .

schools, manufacturers, etc., free of charge. Information on the film may be obtained from the company at 9300 Venice Blvd., Culver City, Calif.

THE QUAKER STATE METALS CO. has awarded a contract for the construction of a new 20,900 sq ft factory on Route 72, Lancaster, Pa. Erection of the plant is scheduled to be completed in March. It will consist of a main single story building with floor space of 12,000 sq ft and three lean-to's, aggregating 8900 sq ft in floor area.

THE U. S. MACHINE CORP., recently became Division Six of Stewart-Warner Corp. Present management and operating personnel of the Lebanon, Ind., plants of U. S. Machine Corp. will continue in their positions, with Carl J. Winkler as head of the division. The Lebanon operations will be designated U. S. Machine Div., Division Six of Stewart-Warner Corp.

THE ANNUAL CONFERENCE of the Iron Fireman Mfg. Co., held late in January, was attended by 70 regional, district, and branch managers and by factory executives. Subjects discussed were the company's expanded production schedules, promotion of its commercial-industrial units, and the prospective consumer advertising campaign.

FUTURE ADVERTISING plans and objectives were discussed at the annual sales meeting of the Timken Silent Automatic Div., Timken-Detroit Axle Co. In addition to point-of-sale and direct mail advertising, the company plans extensive dealer supported newspaper advertising in key market cities.

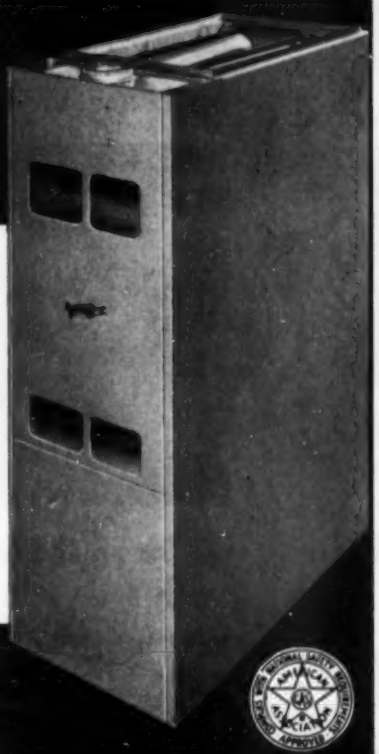
BUSINESS OPTIMISM was the order of the day as regional managers and district sales managers of the Timken Silent Automatic Div. met with management officials at the home office in Jackson, Mich.

THE COLEMAN CO. plans to build 50 air conditioned model homes in various parts of the country before summer. The Blend-Air system, using 3½ in. ducts, will be used to provide heating, cooling and dehumidifying.

A RECORD YEAR for the air conditioning industry is predicted by S. J. Levine, general manager, Home Heating and Cooling Dept., General Electric Co. Mr. Levine estimates that more than 50,000 homes will be equipped with complete air conditioning systems this year.

HEATWAVE *Gas Fired*

FORCED AIR FURNACES



Sales are **CLIMBING because** HEATWAVE **HAS**

WHAT YOUR CUSTOMER DEMANDS

- LOW INSTALLATION COST
- FACTORY ASSEMBLED
- FIRE TESTED AT FACTORY
- 10 YEAR FACTORY GUARANTEE
- 80,000 TO 200,000 B.T.U. INPUT
- COMPETITIVELY PRICED

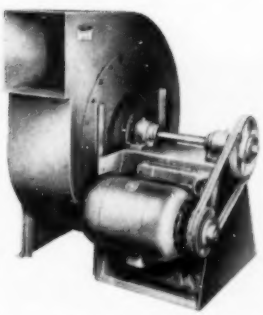
DISTRIBUTED BY OUTSTANDING WHOLESALERS
WRITE OR WIRE FOR NAME OF YOUR DISTRIBUTOR

Southwest Manufacturing Company

BOX 28 AURORA, MISSOURI

A. G. A. APPROVED

CHOOSE A BETTER FAN TO DO THESE JOBS



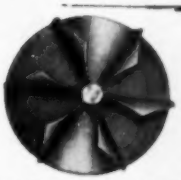
Sturtevant Industrial Fans come in four standard arrangements for integral or separate motor drive, belted or direct-connected.

FOR EXHAUST AND CIRCULATION

Select the efficient Air Handling Wheel for smoke, fumes, gases or light dusts; for even circulating, heat treating, process and product cooling. Uses smaller motors.

FOR MATERIAL HANDLING

Select the Material Handling Wheel, especially designed for exhausting grinding and buffing wheels; conveying granular materials, chips and sawdust.



FOR STRINGY MATERIALS

Select the Long Shavings Wheel, especially designed for long, stringy, fibrous materials which must pass through the fan.

Catalog 1150 gives complete data on this fan and its 3 wheel types. Call your local Westinghouse-Sturtevant office, or use this coupon.

YOU CAN BE SURE...IF IT'S

Westinghouse

AIR HANDLING

J-80292

Westinghouse Elec. Corp.
Sturtevant Division, Hyde Park, Boston 36, Mass.
Please send me Catalog 1150 on the Industrial Fan.

Name_____

Company_____

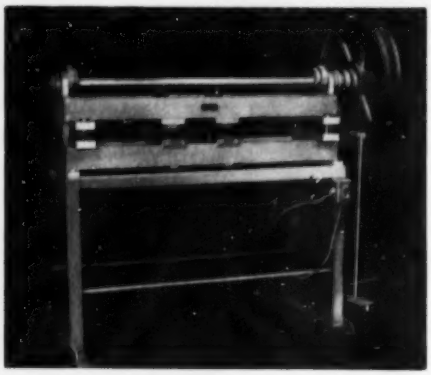
Title_____

Address_____

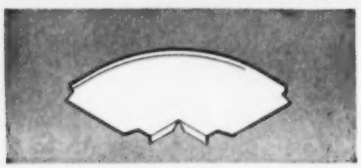
City_____ Zone___ State_____

FALLSINGTON

SAVE DOLLARS
WITH A
FALLSINGTON HUSKY PRESS



Do it the easy way
with a Fallsington Husky.



The Husky Press is of a straight-forward all welded design with no fancy fixtures or dead weight in castings.

The Husky Press will stamp accurate blanks of any shape representing 65 lineal inches in sheet metal 24 gauge or less at a high rate of speed.

For heavier work investigate our **New** Fallsington Multi Die Press — pictured below.

The Multi Die Press is ideal for short runs with Dies made of Kirksite or any other soft material dies.

Write for demonstration, our sales Representative will call with demonstrator.

FALLSINGTON MANUFACTURING CO.
FALLSINGTON, PA.
Manufacturers
SHEET METAL MACHINERY & TOOLS

appointments . . .

D. H. KINNAN as chairman of the board and W. J. Olsen as president, Armstrong Furnace Co. Mr. Kinnan has been president of the company for 12 years. Mr. Olsen has been general manager of the Columbus factory for three years.

O. J. RESS as chief engineer and N. E. Hill as manager of product engineering for the L. J. Mueller Furnace Co. Mr. Ress will be responsible for general supervision of all product engineering activities including design and testing, application, field service engineering, etc. Mr. Hill assumes charge of the design and development of new products. Formation of a sales engineering department, headed by R. W. Weekes, has been announced by the company. Mr. Weekes is in charge of furnaces as well as being manager of the department. He is assisted by L. A. Miles, D. G. Spahr, and G. M. Hase.

O. J. Ress

N. E. Hill

R. W. Weekes

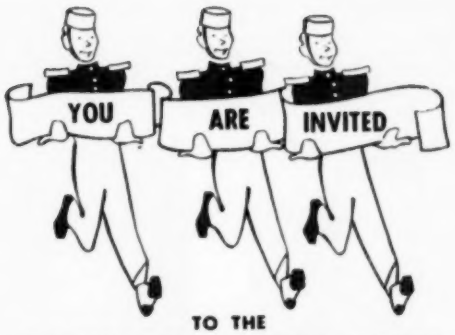
BERNARD A. SEIPLE as manager of the newly formed gas heating division of York-Shipley, Inc. Mr. Seiple will direct a sales campaign on winter air conditioners, conversion burners, etc.

B. A. Seiple

Robert Friedel

ROBERT FRIEDEL as staff specialist in charge of the residential air conditioning program for Chrysler Airtemp Div., Chrysler Corp. He will direct promotion and sales of residential air conditioning.

HOWARD C. WILLIAMS as general sales manager of the sheet division of Continental Steel Corp., Kokomo, Ind. Mr. Williams has served as a sales representative and has held various other positions in the sales department. Prior to his recent promotion, he was sales manager of the sheet division. Ray G. Reynolds, formerly acting



TO THE

EDGEWATER BEACH HOTEL

CHICAGO

APRIL 20—21—22

OIL HEAT INDUSTRY MEETINGS

OF THE

31ST ANNUAL OHI CONVENTION

FEATURING

- ★ Industry subjects of vital interest to everybody in every branch of the industry.
- ★ An all-star cast of speakers — dealers, oil men, manufacturers, economists, engineers. All experts in their lines.
- ★ New ideas and methods galore—practical, profitable for you.
- ★ Fun and frolic, too. Special entertainment for your lady.

★

IT'S FREE

No registration or admission fees to any of the general sessions.

RESERVATIONS
Write Reserv. Mgr., Edgewater Beach Hotel, 5300 Sheridan Road, Chicago 40, Illinois. Advise you're coming to OHI Convention; accommodations wanted, time of arrival and departure.
OHI

OIL-HEAT INSTITUTE OF AMERICA, INC.
500 FIFTH AVENUE, NEW YORK 36, N. Y.

What Machine-Cast (Castomatic) Solder Means to YOU...

It means that you can now get a bar solder that works faster, easier and better because it is made in enclosed molds, out of contact with air, on patented, electronically controlled machines. Ordinary bar solder is hand-cast in open molds.

Castomatic solder of a given analysis always melts at the same temperature. Flow is uninterrupted, work easier. It has no hard spots; no voids to cause sputtering, no segregation to make melting uneven.

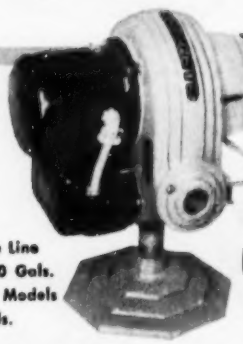
Federated research and field service men work constantly with hundreds of items of non-ferrous origin. What they know and learn about each of these helps to make Castomatic solder and every other Federated product the best that man and science can produce . . . helps make Federated "Headquarters for Non-ferrous Metals."

Federated Metals Division

AMERICAN SMELTING AND REFINING COMPANY
120 BROADWAY, NEW YORK 5, N. Y.
In Canada: Federated Metals Canada, Ltd., Toronto, Montreal

Aluminum and Magnesium • Babbitts • Brasses and Bronzes • Anodes
Die Casting Metals • Lead and Lead Products • Solders • Type Metals

REACH OUT FOR MORE SALES WITH Radiant



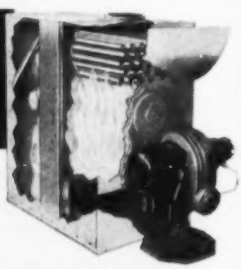
A Complete Line from ¼—30 Gals. Shell Head Models ½—10 Gals.

RESIDENTIAL
COMMERCIAL
INDUSTRIAL

Every PROFIT Reason Says—BUY RADIANT!

Performance—Equal to the highest priced burners. Price — Meets competition every time . . . *plus* — Low Upkeep — Factory Guarantee . . . National Distribution . . . Protected Territories . . . Easy Installation . . . Minimum Servicing.

THE *Radiant*
OIL FIRED WINTER AIR CONDITIONER



Precision Engineered for Economy in Price—Installation—Operation

SUPERIOR DESIGN — Tubular construction presents greater heating surface to flue gases than conventional furnaces . . . jacket is substantial and well finished . . . high temperature combustion chamber . . . motor driven blower unit and air filters.

FACTORY ASSEMBLED—Shipped complete with combustion chamber installed and jacket completely assembled.

Available in Four Models: Low Boy, Suspended Unit, Hi Boy, Counterflow

WRITE FOR COMPLETE RADIANT LITERATURE. You'll sell— and profit more!

RADIANT UTILITIES CORP.
8817 18th Avenue, Brooklyn 14, N. Y.

RADIANT OIL BURNER

appointments . . .

advertising manager, has been named advertising manager of the company.

R. G. Reynolds

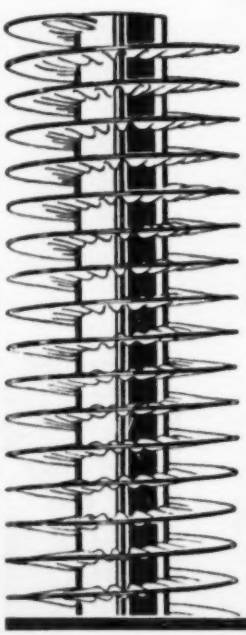
D. P. Shafer

DONALD P. SHAFER as manager of the Columbus, Ohio, branch office of General Controls Co. His duties will include the handling of sales, engineering and service of the company's line of automatic controls in the Columbus area.

FRANK H. STALL as secretary and sales manager, and Edward G. Ziegler as manager of sheet metal fabrication for the Quality Heating Supply Co., Cincinnati.

ANDREW F. WARD, previously Gas-O-Matic sales manager for the Williams Div., Eureka Williams Corp., as

AEROFIN



FIN-TYPE COILS For Fast, Efficient HEATING and COOLING

Write for Information

AEROFIN CORPORATION
S. Geddes St. Syracuse 4, N.Y.

It's the *LOW DOWN* DIRT trapped by WILSON'S HAIR FILTERS that GUARANTEES LONGER LIFE

In Wilson *Hair* Filters the entire dust-holding capacity is completely utilized. This means, *no surface dust stopping only*, but Full-Depth Dust Trapping at its best . . . and many extra months of filter life.

The *reasons* are so simple:

1. The hair media in Wilson *Hair* Filters act in the same manner as Mother Nature's proven way of filtering the air you breathe. It's the *hair* that cleans the air . . . more easily, more effectively, more economically.
2. The multi-directional distribution of the hair in Wilson *Hair* Filters literally invites all dust and dirt to come in and be trapped throughout the entire filter interior.
3. Most brands of air filters require oiling on their inlet surfaces. This stops dust prematurely, loads up the incoming air side and materially shortens filter life.

Wilson Hair Filters are not oiled on the inlet side. Instead, they receive an even distribution of mineral oil *on their outlet surface*, which:

(a) augments the already amazing ability of the hair itself, to catch and hold dust, and—

(b) builds an impregnable barrier which halts dust and dirt after reaching the furthermost practicable penetration point.

WILSON & CO., INC.
(Air Filter Division) 4100 South Ashland Ave., Chicago 9, Ill.

Wilson Hair Filters are another quality product of Wilson & Co., world-famous for meat products, sports equipment, pharmaceuticals, hair products, etc.

The famous Edgeseal, the original Hair Filter with the patented self-sealing edge.

The popular Honeycomb, the dressed up Hair Filter that is so easy to handle.

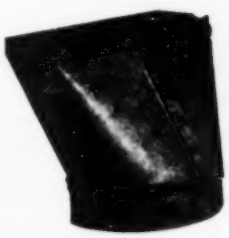
Save delay. Save dollars. Save doubt. Send for FREE sample with details and prices.

INDOOR COMFORT

WILSON'S HAIR FILTER

WILSON & CO.

No. 112 BOOT



No. 110 BOOT

No. 113 BOOT

No. 111 BOOT

No. 164 End of Line Center Takeoff. For use with 2 No. 163.

No. 160 Takeoff Round Pipe to carry branch in or below joist.

GRAY *"Snap-Rite"*

FURNACE PIPE AND FITTINGS
AIR CONDITIONING PIPE AND FITTINGS

A complete line of Gravity and Forced Air Pipe and Fittings with our positive "SNAP-RITE" Lock for quick assembly and erection. Wall Stack and Fittings in 3¼" standard depths. Trunk Pipe and Fittings in 8" standard depths.

Write for Catalog

GRAY METAL PRODUCTS, INC.

30 Carlton Street
Rochester 7, New York

Put a
FINE FINISH
on your work with

Sal-Mo ASBESTOS
PIPE JOINT TAPE

EASILY and quickly applied, this famous material assures a neat, clean-looking job—no rough edges.

Put up now in the brand-new package shown here—12 rolls of 3-inch tape (1,008 ft.) or 18 rolls of 2-inch tape (1,512 ft.).

ORDER A SUPPLY FROM YOUR WHOLESALER TODAY

How's Your Stock of these other *Sal-Mo* ASBESTOS PRODUCTS?

Big season for heating installations coming up. Stock up now while our stocks are up and prompt delivery from your wholesaler is assured.

SAL-MO ASBESTOS PAPER • SAL-MO ASBESTOS MILLBOARD • SAL-MO ASBESTOS CEMENT • SAL-MO ASBESTOS CORRUGATED AIRCELL PAPER • SAL-MO ASBESTOS FURNACE CEMENT • SAL-MO ASBESTOS AIRCELL SHEETS AND BLOCKS

THE SALL MOUNTAIN COMPANY
HAMILTON, OHIO

appointments . . .

general sales manager of the division. F. M. Bennett has been appointed eastern area manager of sales for the division. Mr. Bennett will make his headquarters in the Chrysler building, New York City. William C. L. Barker has been named vice president and general manager of Williams Oil-O-Matic of Canada, Ltd.

A. F. Ward

W. C. L. Barker

ANDREW F. CASSIDY as general sales manager for Rheem Mfg. Co. Mr. Cassidy joined the company in 1945.

JOHNSON FILTER SALES CO., Cleveland; the Pittsburgh Air Filter Service Co., Pittsburgh; and Air Filter Sales & Service, Detroit, as representatives for the Farr Co.

ANESCO, INC., 1925 Dorr St., Toledo, as distributor of fiber glass insulation for Libbey-Owens-Ford Glass Co.

OUR ELBOWS HAVE PERFECT FORM

CONDUCTOR PIPE ELBOWS AND SHOES

• All Sizes • All Angles
• All Metals • All Gauges

SEE YOUR JOBBER

The CINCINNATI ELBOW CO.
2021 EASTERN AVE.
CINCINNATI 2, OHIO

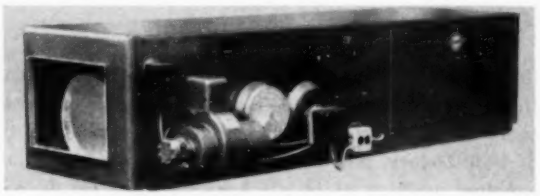
Horizontal Furnaces Opening New Profit Opportunities

Heating Contractors Help Builders Beat Rising Costs and Make Money Doing It

Keeping the cost of new homes within the reach of potential buyers is a major problem today. Builders and contractors are meeting it in two ways: First, to beat the high cost of single lots, they are developing large tracts of land and building many homes at the same time. Second, they are eliminating every possible costly feature — basements, garages, even service rooms.

New Furnace Opens New Field

This is opening up a whole new field of opportunity for the heating and sheet metal contractor—the sale and installation of underfloor central warm air heating systems. The sensational NEW "Besser Junior" makes central heat possible in even the lowest cost homes.



The Besser Horizontal Furnace Needs No Basement or Utility Room — Can be Installed Under-floor or Overhead

Because of the great savings, more and more builders are turning to the new type horizontal, oil-burning furnaces. A central heating system adds value to any house, makes it easier to sell—is far superior to floor furnaces. Now, the NEW "Besser Junior" brings central heat within every price range.

Here's Where Profits Are Made

Bidding on the big jobs is always competitive, so where do you come in? Here's the answer: to start with, you've got something to sell—the answer to a builder's prayer—a way to put central heat into every house without the cost of a basement or utility room. That's a natural advantage. Now, the cost is lower than ever.

Still, you may have to figure closely, so where's your profit? Right here! Service call-backs are what eat up your profit. When you install a Besser Horizontal, service calls are fewer—far fewer—because only the best goes into a Besser! Properly installed, it's virtually trouble-free. Call-backs will be few and far between. Every Besser is fully guaranteed . . . because it's built to last!

Besser Plant Facilities Expanded 50% to Meet Growing Demand

Double Sales Possibilities

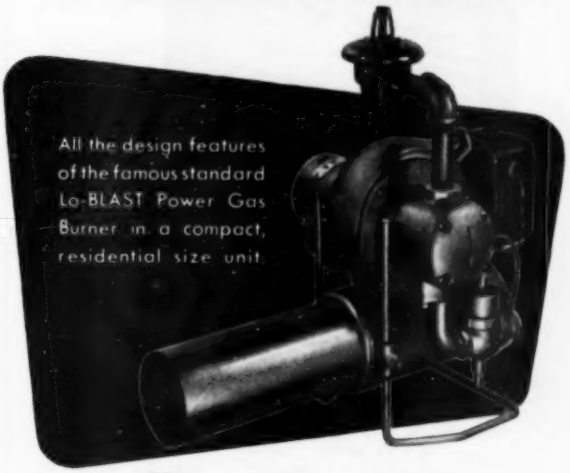
Quiet, automatic Besser Horizontals are equally adaptable to overhead installation on commercial jobs where floor space is at a premium. One furnace gives you a double sales potential. Full range of sizes to meet every job need—delivered to you assembled, ready to install.

New Territories To Be Opened

Greatly expanded plant facilities make it possible to serve a larger area. Distributor franchises and dealerships in certain areas offer a real opportunity for profit in a product you can sell with confidence. Inquiries from aggressive Manufacturer's Agents invited. For full information write: Besser Metal Products Corp., 754 Clement Ave., P. O. Box 4064, Charlotte, N. C.

"mighty mite"

OF CONVERSION GAS BURNERS



LO-BLAST ECONOMITE

Averages 10% less in fuel consumption • easy to install • safe in operation • no "pop" at start and stop • easy to service • long-lived. Capacities from 70,000 to 500,000 BTU.

Economite power burner design means perfect combustion—fuel saved. It assures quiet operation, no combustion roar. Shipped to you completely assembled—equipped with every device for safe operation—factory tested on gas.

All parts are accessible—there's nothing in the fire box but the fire. Simplicity of design and durable construction. cuts service to a bare minimum.

When you see an Economite, you'll realize that here, indeed, is an utterly *different and better* gas burner.

DEALERS!

Write today for full information on this outstanding gas burner. Nothing like it on the market—a sure profit maker!

STANDARD Lo-BLAST BURNER

Approved by leading utility companies and consulting engineers. Capacities to 20,000,000 BTU.

MID-CONTINENT
METAL PRODUCTS CO.
1960 N. Clybourn Ave., Chicago 14, Ill.

W. A. WHITNEY LEVER PUNCHES
FOR EVERY SHOP AND TOOL BOX

No. 4B Punch

Capacity — ¼" hole through 16 gauge metal
Length — 8½" Depth of throat — 2"
Weight — 3 lbs. Stock size punches 1/16 to 9/32" by 64ths.

Write for catalog — then contact your jobber.

W. A. WHITNEY MFG. CO.
636 RACE ST. ROCKFORD ILL.

appointments . . .

Territory will include northwestern Ohio, northeastern Indiana, and southern Michigan. Mark Joseph Wells has been named field representative for fiber glass sales in the St. Louis industrial area and the southwest region. His headquarters will be at 411 N. Seventh St.

ELDON L. RICHARDSON as supervisor of the new home market, with headquarters in Minneapolis, for Minneapolis-Honeywell Regulator Co. Harold Chamberlain has been named modernization market supervisor.

RALPH J. CRAWFORD as assistant sales manager, San Francisco branch, and Richard O. Austin as assistant sales manager, Sacramento plumbing and heating branch of the Dallman Co.

RICHARD J. CROUSE as general manager of National Heater Co., Inc. He will be responsible for departmental coordination, purchasing, and general supervision of the St. Paul factory. The company has just completed a new one-story addition which will house facilities for the wiring, assembly, and check-out of space heaters.

ROBERT P. MELIUS as merchandising manager of the Skil Corp. Mr. Melius replaces William Ferry, who has been named industrial sales manager. Jack T. Carlsen, former

Darling it's so exciting . . .
I just can't wait
to see those sensational, new

STANDFORATED
Perimeter Baseboard Registers
WITH SLIDING DAMPER CONTROL

Write Now for Your Free Copy of Standard's Amazing New Pocket Catalog

- Used in homes, schools, churches and commercial installations.
- Comes in four foot sections.
- Simplifies balancing of heating systems.
- Fabricated of 20 gauge steel.
- Finished with Prime Coat only—special finishes on request.

Standard Stamping & Perforating Co.
3151 WEST 49th PLACE, CHICAGO 32, ILLINOIS

. . . this is the address . . .

FOR PERFECT FITTINGS ON EVERY INSTALLATION . . NATURALLY, THEY'RE

Youngstown FITTINGS

All you have to do is send your order to us at the address below and your troubles with furnace fittings become things of the past. Youngstown Fittings are designed to go in right the FIRST time — no cutting or juggling to eat into your costs by slowing up your men. Get on the Youngstown bandwagon now . . . write us for literature.

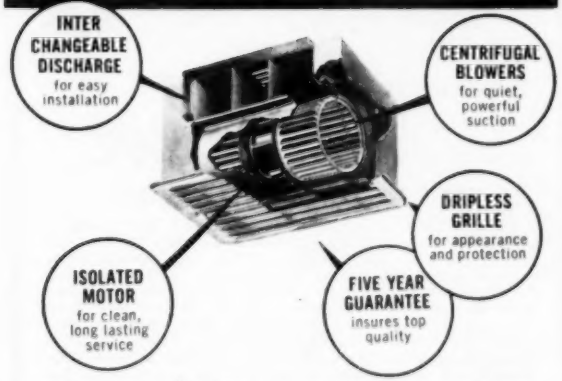
YOUNGSTOWN FURNACE COMPANY
627 Marshall St. Youngstown, Ohio

This Can't Happen with "National Metal" "ANGLE RINGS!

Insist on Angle Rings that are rolled correctly to your specification and avoid trouble and delays. All Rings correctly made to size — with a true circle and 90 angle. Furnished with or without holes. Write for list of stock sizes and discounts.

NATIONAL METAL FABRICATORS
2140 S. Sawyer Avenue Chicago 23, Ill.

ONLY THE
TRADE-WIND CLIPPER
KITCHEN AND SMALL ROOM VENTILATORS
give you 5 quality features


INTER CHANGEABLE DISCHARGE for easy installation
CENTRIFUGAL BLOWERS for quiet, powerful suction
DRIPLESS GRILLE for appearance and protection
ISOLATED MOTOR for clean, long lasting service
FIVE YEAR GUARANTEE insures top quality

MODEL 1201 100 C.F.M. for bathrooms — time delay switch optional.
MODEL 1501 300 C.F.M. for average kitchen, laundries, dens.
MODEL 2501 425 C.F.M. for large kitchens and other rooms up to 2000 cu. ft.
MODEL 3501 550 C.F.M. for installation in cabinet over range. Hood optional.

TRADE-WIND MOTORFANS, INC.
5717 SOUTH MAIN ST. LOS ANGELES 37, CALIF.

PIPE AND FITTINGS GUARANTEED QUALITY!

All Ajax fittings are made of high-grade, full gauge sheets . . . no seconds used! Quality is fully guaranteed. Your order, large or small, receives prompt, personal attention.

Scientifically designed to reduce air friction

For help on your heating problems our engineering department is at your service. Contact us . . . we'll gladly work with you.

Write for catalog of Furnace Fittings.

Double seamed for strength and air-tight construction

Ajax Furnace Fitting Co.
Division of
The Cincinnati Sheet Metal & Roofing Co.
216-20 E. FRONT ST. CINCINNATI, OHIO

OYLTITE-STIK is a new positive oil seal that saves costly repairs to leaky storage tanks, pipes or containers. Easy to use . . . leaks can be stopped instantly . . . just rub OYLTITE-STIK over the leaky area.

The material does not become brittle . . . withstands normal vibration.

Use OYLTITE-STIK for positive sealing of oil leaks. Send for further information and prices.

LAKE CHEMICAL CO.
LACO
3051 W. Carroll Avenue, Chicago 12, Illinois

appointments . . .

industrial sales manager, will direct the company's newly formed sales training division.

NORRIS BLANCHARD, the Norris Blanchard Co., W.O.W. Bldg., Omaha, as representative in the states of Iowa, Nebraska, and South Dakota for the Thermo-Base Div., Gerwin Industries.

Norris Blanchard

Walter Schmidt

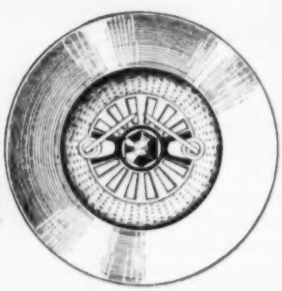
WALTER SCHMIDT as director of engineering of the Air Conditioning Div., Remington Corp. Mr. Schmidt will head the division's engineering and design activities.

PAUL A. HILTON as general manager of Servel-New York Corp., distributing subsidiary for Servel, Inc., in New York City, Long Island, and Westchester. Snook & Aderton, Inc., Lubbock, Texas, has been appointed air

PULSATION? POOR CO_2?

The Answer:

Install a New BOSTON COMBUSTION HEAD



Adaptable to any pressure atomizing burner. .75 to 3.0 G.P.H. This precision head is now available. Adjustable air shutters permit obtaining high efficiency sunflower flame or efficient non-pulsating flame.

Comes complete—easily installed.

A PROFIT MAKER

Write for literature and instruction sheet.

BOSTON MACHINE WORKS COMPANY
Oil Heating Supplies Division. Manufacturers, Lynn, Mass.

SIZES FOR *EVERY* NEED IN STOCK *CONSTANTLY!*

Allen Type "C" Turbine Ventilator

WIND-DRIVEN *Allen*

TURBINE VENTILATORS

Additional facilities (to keep pace with demand we've greatly increased our space!) now enable us to manufacture Allen Turbine Ventilators in a separate plant. This means that many of these accurately rated, highly regarded ventilators are in stock, in copper as well as coated iron, ready for immediate delivery, in throat diameters, 6 to 48 inches. Another type, motor-equipped Electro-Wind Turbine Ventilator, can be supplied for use in areas where wind velocities are not always sufficient. When roof ventilation is the answer to an air displacement problem, Allen ventilation can do the job—economically and performance-wise. Engineering assistance available. Our representatives are in most principal cities; names listed in our catalog in Sweet's Architectural File, Section 20b.

Write for catalog on complete line of roof ventilators.

ALLEN ENGINEERED VENTILATION

PRODUCTION PLANNING CO.
ROCHESTER, MICHIGAN
Roof Ventilators for Every Commercial and Industrial Need

SCHAEFER
COPPER TUBE FITTING BRUSHES

Clean Fittings Faster and Easier!

A quick twist, and your fittings are clean — with these amazing time-savers! Made of Stainless Steel Wire, strong, stiff, wear-resisting, corrosion-proof, secured in 4-ply wire handle with wood grip. Individually boxed in 12 sizes — ⅛" to 2-⅛" O.D., and ¼" to 2" I.D. Sizes.

Write for prices — and complete Schaefer Boiler and Furnace Brush Catalog No. 650.

SCHAEFER BRUSHES — MILWAUKEE —

SCHAEFER BRUSH MFG. CO.
117 W. Walker St., Milwaukee 4, Wis.
BUY SCHAEFER . . . IT'S SAFER

1st CHOICE of Both FURNACE MANUFACTURERS AND CONTRACTORS

Standard in the field for nearly 40 years. THARCO stays put! — No shrinking, cracking or checking. Now available in either black or light gray in 1-pound cans to 350-pound drums. Order from your jobber.

The ARMSTRONG COMPANY

241 S. Post Street — Detroit 17, Michigan

CHICAGO

Steel PRESS BRAKES

Many Standard Sizes
Latest Designs
and Features
for Fast Accurate Work.

Complete line of induction hardened forming dies for all makes of press brakes.

All sizes of CHICAGO press brakes are readily adapted for a wide variety of bending, forming, drawing, notching, blanking, punching, embossing, etc.

Full Particulars and Recommendations for Any Job upon Request

DREIS & KRUMP MANUFACTURING COMPANY
CHICAGO
7404 S. Loomis Blvd., Chicago 36, Illinois

Save TIME on every job

use "Made-Rite" fittings

One sure way to KEEP down job time is to check on the time spent in assembling warm and cold air runs. If it's excessive according to accepted standards then you'll do well to change your source of fittings.

That's the time to check with us . . . Made-Rite is a superior line of furnace fittings that will enable your men to work at top speed with no time lost in cutting or juggling. If you'll write, we'll prove it to you!

We solicit inquiries on slitting and recoiling, or shearing to lengths, of metal up to 36" wide — 14 gauge or lighter.

"Made-Rite" Co., Inc.

Manufacturers & Suppliers
Furnaces — Pipe & Fittings

10th and Monroe St. — Newport, Ky.

TORCH-O- says:

"I'm trigger controlled for faster, easier soldering—brazing—melting"

Torch-o-matic saves time—saves gas! Just pull the trigger and air-acetylene gas automatically ignites—release trigger and gas shuts off instantly. No hazard from open flame when not in use. One-hand operation with no "time-out" to light up and adjust. Pays for itself many times over in savings and convenience. Three sizes of tubes and nozzles take care of any job. Fits your present equipment. Write for complete details.

VELOCITY POWER TOOL COMPANY
201 N. Braddock Ave. • Pittsburgh 8, Pa.

"RETIRED?" No, he's the Royal-Jet dealer. An active heating contractor can make an extra buck with the Royal line. *Why don't you drop us a line? A dealership may be open in your area.* Write to Jim Scruton, Royal Heaters, Inc., Alhambra, Calif.

appointments . . .

conditioning distributor for the south plains area of west Texas. The new distributors also will operate an office in Midland, Texas.

General Construction Co., 339 Brown Marx Bldg., Birmingham 3, as district representative of Eclipse Fuel Engineering Co., covering Alabama and northwestern Florida. Frank Matzek and Charles Herron of that company will handle sales and service for Eclipse's complete line of furnaces, combustion equipment and other heating equipment.

William C. Egan as assistant to the president of Carrier Corp. Mr. Egan joined the organization in 1942, starting in the production control department. He has served as regional merchandising manager at Chicago and prior to his promotion, was district dealer manager at Cleveland.

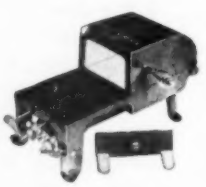
Robert G. Duncan as district sales manager for oil and gas heating equipment for Timken Silent Automatic Products Div., Timken-Detroit Axle Co. His territory will comprise Vermont, part of New Hampshire and part of Massachusetts. D. Robert Green has been appointed

MORE HEAT FOR YOUR DOLLAR
WITH JOHNSON BENCH SOLDERING FURNACES

1800°F. without forced air blast.

No. 101 Bench Furnace

The most efficient, powerful and economical bench furnace made for heating soldering coppers up to 12 lbs. per pair. Also used for heat treating, case hardening, and annealing carbon steels. Two burners. Firebox 3¾ x 4½ x 5½. Complete with work rest block and baffle plate. $18.80 F.O.B. factory.



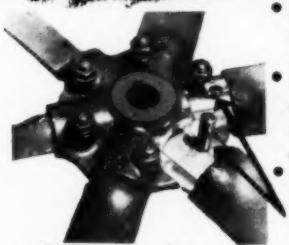
No. 118 Combination Bench Furnace

For heating largest soldering coppers, stenciling irons, branding irons, etc.; heat treating carbon steels, and soft metal melting. Lid on hood is removable for inserting 22 lb. pot for melting lead, tin, babbitt, etc. Three burners. Firebox 6¼ x 5 x 6½. Complete with pot. $35.00 F.O.B. factory.

WRITE FOR FREE LITERATURE

JOHNSON GAS APPLIANCE CO.
580 E AVENUE N.W. CEDAR RAPIDS, IOWA

Every COOK Fan Blade is *Individually* precision set



- All blades balanced and set to proper pitch for rated horsepower and CFM.
- Aluminum hub and blade, cast separately, machined and fitted with precision accuracy.
- Blade is securely locked to hub for long life and true pitch by taper pin bolt.

The cut-away photo above shows why rugged Cook Fans last longer and actually deliver their stated capacity. Each blade is individually set to the proper pitch for the rated horsepower and CFM. Thousands of Cook-built propellors have already proved their dependability.

Sell Cook Industrial Fans and the New Cook "Chimney Style"* Attic Fan

Up-Blast Roof Ventilator in 16" to 48" sizes. Automatic dampers. Acid resistant coated, aluminum blades, up to 40,000 cfm output.

*Patent pending.

New "Chimney Style" Attic Fan saves attic space. Acid resistant coated steel chimney housing a direct drive fan. Easy to install, automatic dampers. Three sizes.

Cook Duct Fans. Direct or belt drive. Orifice 16" to 48". Ideal for spray booths.

Cook Type S Fans. Frame 24" to 48". Easy to install. Glass-insulated or explosion proof.

Portable Man-Cooler. Adjustable welded steel frame on rollers. Propellor 16" to 48".

COOK

Write for new catalog to Dept. AA, Loren Cook Co., Berea, Ohio

FROM ANY ANGLE . . .

. . . *it pays to see your* **Jobber**

See him for

GALVAN

- easier to install
- better fitting

ELBOWS

in all angles and metals

Also . . .

- Tite-Top funnels
- Rain Water Cut-Offs

GALVAN *Manufacturing Co.*
New Albany Indiana

Do it the MELAWAY

SPLICE GUTTERS

IN 1/10TH THE TIME

***with* MELAWAY Couplings**

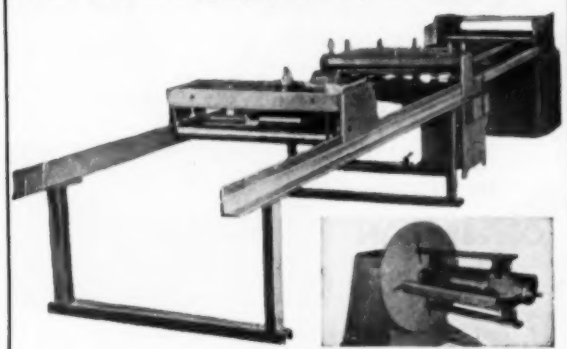
• SAVES TIME • STRONGER JOINTS • COSTS CUT IN HALF • QUICK, TIGHT PATCHING • ONLY ONE TOOL NEEDED • SIMPLE AND EASY TO USE • SHORT ENDS USED—NOT WASTED

MELAWAY CORPORATION

BRANDON, WISCONSIN

Telephone 1361

Modern De-Coiling Equipment by "DAHLSTROM"



Coiled materials are fed, straightened, measured, cut into sheets, and ejected on a continuous basis automatically. Line shown handles to 36" widths in 20 ga. mild steel—coil weights to 6000#. OTHER CAPACITIES AVAILABLE.

Inset shows self centering coil reel which is part of the complete line—Unit has infinitely variable speed drive between 35 and 100 fpm.

PURCHASE ALL YOUR MATERIALS IN COILED FORM AND ENJOY THE FOLLOWING ADVANTAGES:

- Lower material inventories
- Less Scrap (sheets can be cut to exact lengths needed)
- Material handling savings
- Tons more storage in the same space

DAHLSTROM MACHINE WORKS, INC.

4227 West Belmont Ave. Chicago 41, Ill.

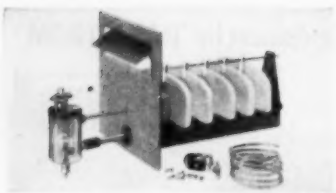
Cut Installation Costs!
One hammer blow permanently rivets

E-Z-ON

E-Z-ON Damper Controls are easily, quickly installed to save you time and money. E-Z-ONS lower initial cost offers you additional savings and extra profits. Start saving money now. . . . Call your jobber today!

LEADING JOBBERS STOCK "EZ-ONS"
In Canada — THERMIDAIRE CORP. LTD. Toronto

M. A. GERETT CORP.
724 WEST WINNEBAGO STREET, MILWAUKEE 5, WISCONSIN



For EXTRA SALES

in the OFF-SEASON MONTHS

Foresighted buyers install new heating equipment and make repairs during the off-heating months. But it's during the heating season that these same buyers notice the effects of dryness, and recognize the need for re-humidifying the air.
NOW — while these effects are apparent — is the time to sell Monmouth Humidifiers — to keep your crew profitably employed installing them. They are easy to sell to home owners who value their furniture and have concern for their children's health. One or both of these arguments will enable you and your men on service calls to make many extra sales.
Monmouth comes packaged complete — in 16 sizes up to 420,000 B.T.U. All employ the Monite fast vapor diffusion plate, and time-tested Flotrol or Microfeed control.
Monmouth can make money for you in the off season. Write for complete descriptive literature.

THE CLEVELAND HUMIDIFIER CO.
7802 Wade Park Avenue **Cleveland 3, Ohio**

MONMOUTH HUMIDIFIERS

appointments . . .

district sales manager in New Jersey under direction of F. M. Jordan, regional manager.

R. G. Duncan

D. R. Green

GEORGE H. KENNEDY as assistant to Willard M. Milbourne, sales manager, the Calcinator Corp., Bay City, Mich., manufacturers of automatic garbage disposal units.

MARTIN C. BROWN as manager of the steel building products sales division, Berger Mfg. Div., Republic Steel Corp. Russell L. Seiple succeeds Mr. Brown as assistant manager of steel building products sales. Gerald L. Haynam becomes district manager of the northern and central Ohio district of the company's steel equipment sales division.

NEW Beverly SLITTING SHEAR

More Power...
Easier Cutting
Exclusive Design
Cleaner Cuts
Ruggedly Built
last a lifetime
Capacities to 3/16"

SS-3 3/16" slitting cap; 5/16" trimming, 1/4" x 2" bar capacity

Get faster, easier slitting and trimming with a new design Beverly "SS" Series Slitting Shear. Rigid, strongly braced frame; compounded linkage and extra strength where needed. Many exclusive features. Write for FREE illustrated Bulletin.

See your Beverly Distributor today.
Ask for a demonstration — no obligation.

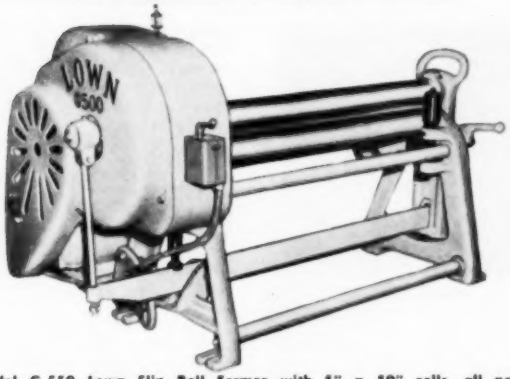
Beverly SHEAR MFG. CO.
3020 W. 111th STREET • CHICAGO 43, ILLINOIS

Another

LOWN SLIP ROLL FORMING MACHINE

New Model G-500

featuring Cone Rolling Attachment



Model G-550 Lown Slip Roll Former with 5" x 50" rolls, all power driven

A new improved modern design, engineered for durability, strength and service.

- Initial Pinch Type — Alemite Lubrication
- Capacity Model B-550, 8 - 10 gauge 4' wide. (Available in shorter or longer lengths)
- Quick Acting Latch on Drop Arm.
- Handwheel Adjustment of Rear Roll.
- Roll Position Indicators.
- Gear and Shaft Housing of rigid Unit construction.
- Fast, sturdy, easy to operate. Prompt Deliveries.
- Other machines with 2" to 9" dia. rolls also available.

Dealers in Principal Cities *Write for Bulletins—Mention this Ad*

SAN ANGELO FOUNDRY & MACHINE COMPANY

Builders of Better Rolls

1000 East Upton San Angelo, Texas

When Paint Goes On Easy . . .

. . . hides well with one coat, covers more squares per gallon, dries quickly, and sets up fast so sudden rains won't wash it off, you know you have a superior paint because it saves you time, trouble, and money.

. . . And "370 SPECIAL" is the red oxide paint that gives you all these advantages. That's why it is recognized and has been recognized for years as a standard of quality by tinners and sheet metal contractors.

Try "370 SPECIAL" and you'll see for yourself that it more than meets expectations. Your customers will be pleased, too, with its rich red color that stays red, and its long time protection from corrosion.

THOMPSON & COMPANY

1085 Allegheny Avenue • Oakmont, Pennsylvania

ESTABLISHED 1847

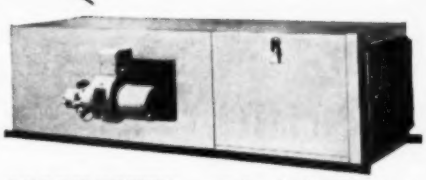
QUIET AUTOMATIC

OIL FURNACES

SUSPENDED

Or Laydown Air Conditioning

FURNACES



SPACE SAVER...and a Labor Saver

It comes completely assembled including combustion chamber. For Garages, Service Stations, and Basementless Homes. Made in sizes from 75,000 BTU to 600,000 BTU.

Approved by Leading Oil Companies, Underwriters and Municipalities. WRITE TODAY FOR FULL DETAILS

A PRODUCT OF

QUIET AUTOMATIC BURNER CORP.

J. G. KAVENY, President

33-35 BLOOMFIELD AVE. NEWARK 4, N. J.

Gives the **GRIP OF HERCULES** *TO ANYONE*

LOCKS WITH TREMENDOUS GRIP TO ELIMINATE TIRESOME HAND GRIPPING!

VISE-GRIP SHEET METAL TOOL

Now, a squeeze of your hand and VISE-GRIP Sheet Metal Tool *locks* to work with *Powerful Grip.* Won't slip! "Holds like Hercules"—without need for hand gripping. Adjusts to Super-Power plier action to speed up any job! Deep 1-¾" reach. Order from your supplier.

By Maker of the Famous VISE-GRIP Wrench

PETERSEN MFG. CO., Dept. AA-3, DE WITT, NEBR.

WALKER FUEL SAVERS

CHECK THESE 9 POINTS OF SUPERIORITY

1 EASE OF ADJUSTMENT
Turn of pointer on calibrated dial instantly selects correct draft. Calibrations correspond to specific draft values.

2 BOX TYPE PIVOT HINGES
Positive sealed bearing surfaces, friction-free nickel-plated hinge pins, protect against corrosion . . . dirt . . . dust. This most expensive construction gives long life.

3 BALANCE PLATE . . .
scientifically designed with accurate brass fittings to maintain correct balance between atmospheric and pressure inside smoke pipe.

4 SPECIFIC PIPE SIZES
Insures correct capacity for every type of installation.

5 ALUMINUM FRAME
Aluminum casting is rigid . . . light . . . long lasting.

6 EASE OF INSTALLATION
Collar or stub furnished to provide quick attachment to pipe.

7 ARMCO ALUMINIZED STEEL
. . . finest available for heat and corrosion resistance.

8 FACTORY-SET
accurate balance . . . assures performance as perfect as possible.

9 INSIDE VIEW

Shows unrestricted area for free flow of air . . . effecting more complete regulation.

NO OTHER DRAFT REGULATOR HAS ALL THESE FEATURES

New WALKER Venturi-Top Chimney Cap

Designed to the basic Venturi engineering principle. Streamlined vane and hood is mounted on a patented friction-free pivot. Always maintains position away from wind to prevent chimney down drafts. Specify this quality device in the 9 out of 10 service calls traceable to insufficient draft. Effective also for ventilating purposes. Pipe size: 8". Larger sizes available soon.

WALKER MFG. & SALES CORP.
1709 Penn St. **St. Joseph, Missouri**

FLANGES THE DUCT

IN LESS THAN 5 SECONDS.

Makes your drive-cleating work so much easier and faster.

Works like a bar-folder with a new twist . . . Handling the work back and forth has been eliminated by a unique manipulation of the bender itself.

These benders are calculated to fit any size duct up to width of bender and any gauge up to 20 Mild Steel, *without adjustments.*

No. 12 SMITH'S CLEAT BENDER (12" wide) $42.00*
No. 18 SMITH'S CLEAT BENDER (18" wide) $66.00*

*Prices FOB Waukegan, Ill.

Write for dealers name

R. E. SMITH
1806 BELVIDERE ST.
WAUKEGAN, ILLINOIS

appointments . . .

BARTH GILCRIST as division manager at Philadelphia for Gustin-Bacon Mfg. Co. Leonard E. Feitt assists him.

Barth Gilcrist

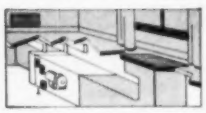
L. E. Feitt

G. L. GRAHAM as district sales manager of the eastern-central area for Century Engineering Corp. His headquarters are in Columbus, Ohio. Mr. Graham was formerly associated with Anchor Heating Equipment, New Albany, Ohio, as regional manager. Roy C. McDowell is now district sales manager for Century, with territory including western Pennsylvania, western New York, western West Virginia, and eastern Ohio. His headquarters are in Cleveland. He has been manager of the eastern heating division of Ko-Z-Aire Mfg. Corp., Red Oak, Ia. E. J. Mettelka, formerly regional sales manager, Kalamazoo Stove and Furnace Co., has been appointed Wisconsin-northern Michigan district sales manager for Century.

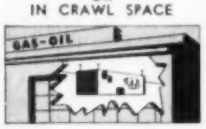
85,000 BTU — OIL-FIRED

FOR CEILING SUSPENSION OR CRAWL-SPACE INSTALLATION

BARD MULTI RADIATOR
WARM AIR HEATING


CEILING SUSPENDED OR IN CRAWL SPACE

Multi-Radiator means more heating surface—greater efficiency. Top-quality burner. Completely wired controls.



UNDERPRICED BECAUSE . . .

Volume production on modern assembly line. Unit inspection for quality control. The greatest value in horizontal furnaces.

UL

. . . Call, Wire, or Write for Price data.

BARD MFG. CO., BRYAN, OHIO

KENT

Double Suction FURNACE CLEANER

You can't make profits without performance — and that's where KENT shines! Two fans mean high vacuum, high air movement . . . low RPM of motor means long life. No outside dustbag, no dust passes through fans . . . low center of gravity, less chance of tipping. Convince yourself: it pays to buy a good tool!

Don't decide till you see the KENT!

Over 40 Years — Serving the World with Quality Equipment

Carries easily — base weighs only 39 pounds, dirt can only 24 pounds!

Full information upon request

CLEAN WITH **KENT** EQUIPMENT

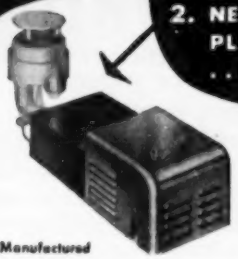
The KENT Company, Inc. • 435 Canal St. • Rome, N. Y.

THESE FACTS HAVE MADE

TEMP-R-IZER

GAS CONVERSION BURNERS FAMOUS!

1. NEVER A HEAD REPLACED . . .
2. NEVER A BAFFLE PLATE REPLACED . . . . . Due to Burning Out.



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The "Air Lock" principle is an exclusive feature.

The extreme efficiency, simplicity of installation and long life are backed by a strong Guarantee.

No fans, blowers or ceramics are used. The line includes domestic, industrial and commercial gas conversion burners. Write for FREE folder.

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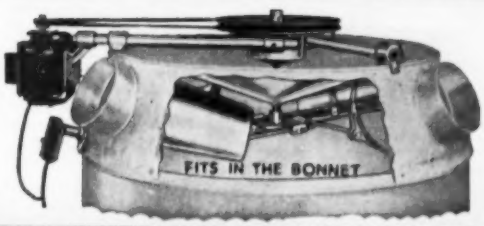

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CIRCULATAIRE solves the problem of "hard to heat" rooms, boosts warm air quickly through all the heating pipes. CIRCULATAIRE is easily and quickly installed without removing the bonnet. Packaged unit includes motor and fan control. No new sheet metal work required, no changing of cold or warm air pipes, no baffles to be built. The CIRCULATAIRE is rigid, quiet and efficient in operation.

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A COMPLETELY PACKAGED UNIT
Nothing for the dealer to furnish except limited amount of labor.

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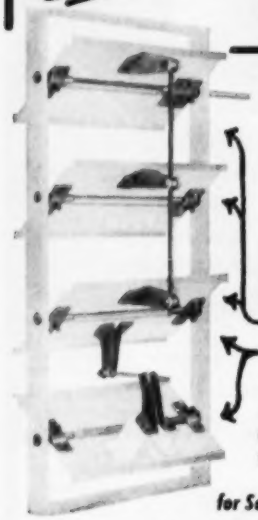

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Note Parallel

OR Opposed blade action

- Each blade quickly adjustable
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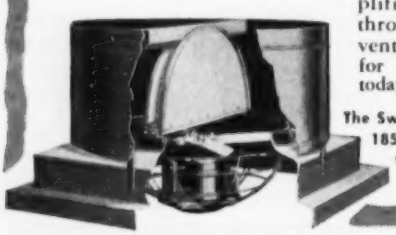
You can literally *throw* heat and fumes out of factory workrooms with this economical, simplified "straight-through" powered ventilator. Write for Bulletin 346J today.



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appointments . . .

BOYD W. TULLIS as vice president in charge of engineering for the Coleman Co., Inc. He will direct all design and research activities dealing with product development. Mr. Tullis joined the company in 1917, has served on the board of directors since 1949.

B. W. Tullis

J. J. LaSalvia

JAMES J. LASALVIA as president of the Osborn Engineering Co., Cleveland, designers and construction counsellors for industrial and commercial buildings, stadiums, etc.

GEORGE A. CARLSON as manager of the new Oakland, Calif., service branch for the Product Service Div., A. O. Smith Corp. The new branch, comprising a 12,000 sq ft building, is intended to provide a central West Coast location for handling replacement parts, repair, etc.

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. . . One piece BLOW PIPE ELBOW SAVES YOU MONEY

- HOODS
- BALL JOINTS
- FLOOR SWEEPS • BLAST GATES
- STAMPED AND ROLLED ANGLE RINGS

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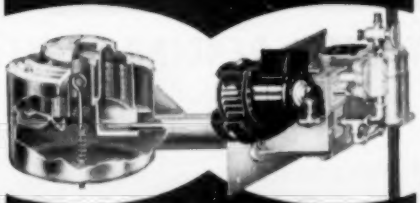

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Heating Products Division

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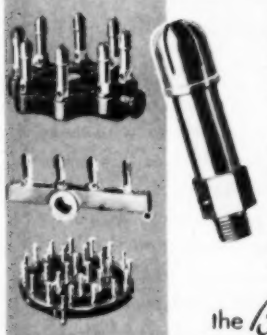

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ALEXANDER MCKENZIE as district sales manager for Miller Electric Mfg. Co., with territory comprising parts of Ohio, Pennsylvania and West Virginia. He will cover the cities of Cleveland, Youngstown and Bridgeport, Ohio; Pittsburgh, Altoona and Indiana, Pa.; and Huntington, Charleston, Williamson and Wheeling, W. Va. Mr. McKenzie has been with Consolidated Aircraft, and more recently with Linde Air Products, as a sales representative.

William J. Woolley

WILLIAM J. WOOLLEY, chairman of the Board of Maid-O'-Mist, Inc., died in his home in Hollywood, Fla., on February 1. Mr. Woolley started in the heating business in Petersburg, Ind., in 1901. He organized and managed the National Trade Extension Bureau with headquarters at Evansville, Ind., to aid heating contractors in accounting, estimating, display, advertising, and selling. In 1925 he became executive vice president of Pierce, Butler and Pierce Mfg. Co. of New York and the Wolff Mfg. Co. of Chicago, becoming president of the latter in 1926. In 1933 he organized Maid-O'-Mist, Inc.

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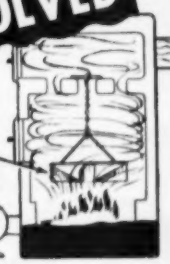

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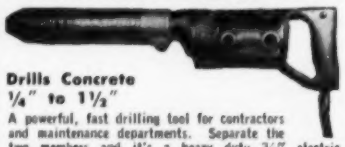

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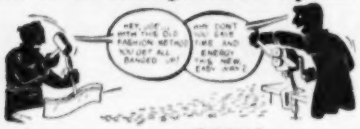

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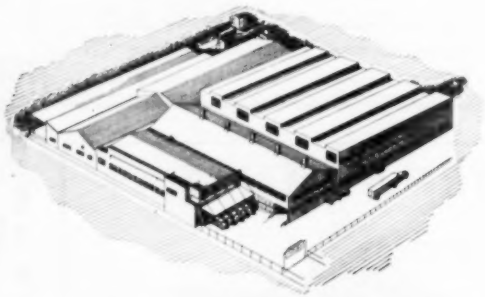

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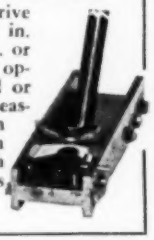

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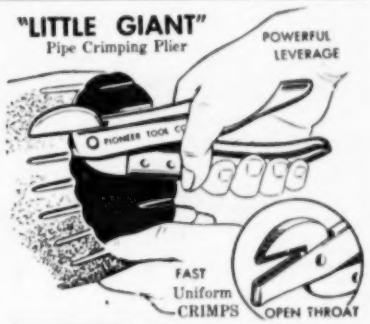

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Has UNBREAKABLE PLASTIC HANDLE and LONG TAPERED ALLOY STEEL BLADE. IT OUTWEARS, OUT PERFORMS other SCRATCH AWLS.

Scratch Awl	90c each - $10.25 a dozen
Replaceable Blades for Awl	45c each
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Pioneer Heavy Duty Compass Blade	.85
Little Giant Pipe Crimper	$1.95
Cutter Clamps 4" 5" 6"	each size $1.95

Send Check or M. O. if your jobber can't supply
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Wanted: Aggressive Sales Manager to take complete charge of Sales Department. A chance of a lifetime offered by one of the oldest established furnace manufacturers. Give full experience and references. Address reply to P. O. Box 5012, Cleveland 15, Ohio.

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WANTED: Shearing any amount — all sizes. Galvanized, cold and hot rolled aluminum. Stainless and copper 6" minimum width 36" minimum length, uniform quantities. Gauges from 16 to 30 inclusive.

Write or wire
Los Angeles Sheet Metal Mfg. Co.
901-905 East 9th Street, Los Angeles 21, Calif.
Trinity 4713

situations open

Salesman to work Sheet Metal, Heating and Plumbing trade in City of Columbus, Ohio. Experienced young man preferred. Mail application to P.O. Box 28, Columbus 16, Ohio.

WANTED . . . SALES EXECUTIVE RETAIL HEATING — Manager to initiate and supervise a newly planned retail heating store. Must be familiar with heating installation and service, merchandising and retail store organization. Unlimited pay opportunity, base plus share of profits. Write stating experience and background to Key 938, American Artisan, 6 N. Michigan Ave., Chicago 2, Ill.

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FOR SALE — Sheet metal shop, tools and stock, at Coshocton, Ohio. Established over thirty years. Good industrial clientele. Sold to settle estate. Address Key 939, American Artisan, 6 N. Michigan Ave., Chicago 2, Ill.

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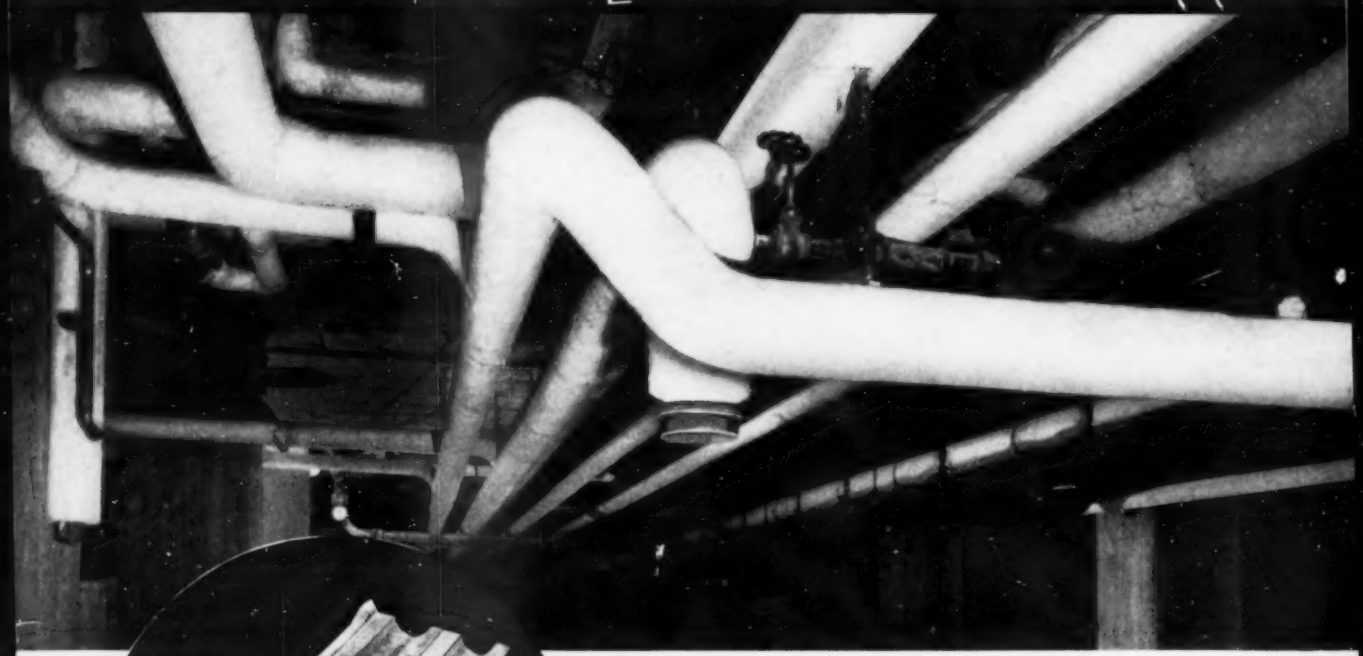

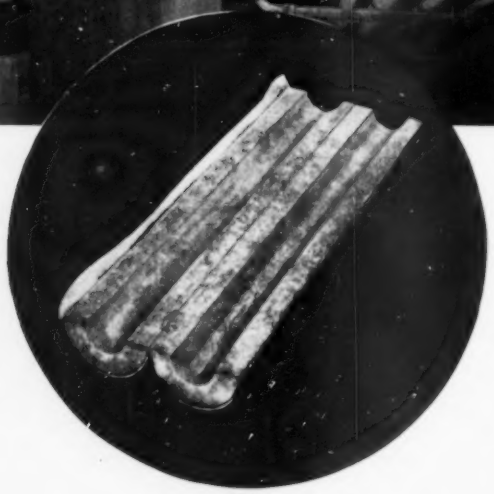

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